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OKLAHOMA STATE MEDICAL ASSOCIATION

EDITORIALS

THE SOUTHERN

On November 5-8, the Southern Medical Association will meet in Dallas. This is the time for Oklahoma to stage "the family turnout." Oklahoma owes much to this great medical association and the profession of the state must continue its loyal support and its scientific contributions.

There is another very good reason why Oklahoma physicians should appear in force at Dallas; it is about time the presidency of the Southern should swing this way. The Southern has had only one president from this state and that was in 1932. Even though this year's president is from Texas, the president-elect is from West Virginia and with this in view, would it not be reasonable to nominate a physician from Oklahoma for the office of president-elect? This can be accomplished not through politics but through propinquity. Let's be there clothed in our best behavior, sufficiently literate and scientifically alert to engender a mutual awareness of the advantages to be gained by a Southern and Oklahoma alliance for 1953.

HENRY ASBURY CHRISTIAN

This morning (August 25, 1951) Henry Christian of Boston suffered a heart attack and joined the shades of the world's great clinicians, teachers and medical writers. Known to every medical student and every physician through his successive editions of Osler's Principles and Practice, through 30 years of Oxford Medicine and his many other scientific publications, his obituary needs no formal recording. In the minds of all who knew him, the story of his life unfolds in gracious intimate flashes of his personal charm and his intellectual attainments controlled by firm convictions, but chastened by tolerance, innate modesty and generosity. Even those who knew him only through his writings have sensed these qualities and are prepared to lament the loss occasionad by his death. Suffice it to say that he stood for everything sound and sane in medicine, and while he lives in presence and his scintillating personality will be missed.

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OKLAHOMA CITY CLINICAL SOCIETY TWENTY-FIRST ANNUAL CONFERENCE

From October 29 through November 1, medical authorities from coast to coast will move on Oklahoma City. They will gather with the President of the American Medical Association, Dr. John W. Cline, to celebrate the arrival of a sound maturity for this 21-year-old Clinical Society.

Here within four consecutive days of authoritative presentations, medical science should almost reach the saturation point. The contributing guests may be expected to bring a summation of the best that has come out of the modern medical era beginning with the 19th Century, culminating in the phenomenal progress of the past 50 years. Never before has the medical profession enjoyed such a rich heritage. Every forward looking physician within reasonable range should plan to spend four profitable days in Oklahoma City. Mark the dates October 29, 30, and 31 - November 1.

A CRITICAL PUBLIC DISILLUSIONED

Under the title, Survey of Physicians Incomes, the *A.M.A. Journal* employs five and one-fourth pages of fine print to report the findings of a study of the 1949 physicians' incomes conducted by the A.M.A. and the Office of Business Economics of the U. S. Department of Commerce. The results of the survey were first published in the July, 1951, *Survey of Current Business.*

Editorially we have space to say only that it is good to have the facts put before the public by the U. S. Department of Commerce with the cooperation of the A.M.A. rather than by any professional agency alone.

It must be generally agreed that the average net income of $11,058.00 before taxes were paid is not enough to knock anybody in the eye. Even the average of the highest paid specialists puts noboby in the upper brackets. A careful study of the complete report by the public is not calculated to arouse envy in the minds of competent citizens, especially when the phy-

sicians' hours are considered and the cost of medical education, in time, money and effort are taken into account.

This report should cause people to wonder about the motivating principles operating in the minds of so many young people who apply for admission to medical school and it should help them to understand that the object of a profession is to serve and not primarily to make money.

In recent years there has been much talk about the prosperity of the medical profession. No doubt this has been greatly exaggerated, yet there is some ground for the popular belief. First of all it must be remembered that medical man must move through the cross section of society and to succeed he must be dressed and equipped for the best. Only can he give his best when he is well paid. He must even have time and money for travel and study if he is to serve well. He must put his best foot forward. When he attempts this he may make a false impression. Also it must be remembered that some doctors have money through patrimony or matrimony or through sheer good business sense. Under such circumstances Cadillacs and fine homes may come easy, as if greased by a big strike and they cause much more gossip and speculation than if they rolled right out of an oil well.

But it must be admitted that always there are a few who love ostentation and display and unfortunately the damn fools in the fold can bring discredit upon the whole profession by flaunting their possessions in the face of those who are less fortunate. The best members of the profession understand this and soon place the proper labels upon the offenders but the public, less capable of proper appraisal, never seems to understand, consequently the reputation of the profession must suffer. Many examples could be cited if space would permit. Let this one offiice and let every doctor think seriously of the consequences.

The following is being quoted from an unidentified lay correspondent. The reader is requested to classify the doctor in question according to his own best judgment.

"Doctor Blank came here with absolutely nothing, and I mean nothing, and left here with plenty of money and driving a Cadillac car. A new one, too. In the three years he was here, he bought and paid cash for a Chevrolet, a Pontiac, a 61, 1950 model Cadillac, and a model 62, 1951 Cadillac."

The source of this doctor's apparent prosperity is not made clear, but the swath he cut in his small community was, to say the least, not commendable.

For the benefit of doubting Thomases and curious critics in connection with the question of income, the following is quoted from the *Oklahoma City Times*.

"The congressional pay question came alive again when a Texas congressman resigned and went back to Texas because he said he couldn't support his wife and five children on a congressman's pay. Other congressmen immediately pointed out that it is time for the government to pay its lawmakers higher wages, so they won't have to seek jobs with utilities. . . . The flat salary of a congressman is $12,500 a year. He also gets $2,500 a year expense allowance which is tax-free. When traveling on essential business he draws 20 cents a mile reimbursement. His stationery, telephone, telegrams are paid for by the government. In addition, he draws around $20,000 a year for office help, and some congressmen designate their wives for full-time secretarial duty at full pay."

Other groups might be cited. Even certain labor union workers when fully employed may do as well, especially if the relative number of hours are considered.

PHYSICIANS MUST LEARN TO WRITE

Discussing the scientific paper, Stanley Vestal says, "Everything worth knowing, everything worth remembering must be learned by each succeeding generation." Chaucer once said, "All the new knowledge of his day came out of old books." In science, this is not true today. All new knowledge regardless of its source must be added. This means that of all people, physicians must learn to write.

In Oklahoma, long ago it was decided at the State Association headquarters, that if the people had been informed from day to day, month to month and year to year about the progress of medicine, the unrest and lack of faith on the part of the public concerning medical care might have been averted. It was thought that if the people had been well informed as to the meaning of medicine, what it has done and what it can do for them in health and disease, the threat of socialized medicine might have been less imminent.

Keenly conscious of this sin of omission and believing that if the American Medical Association had carried on a sustained campaign of good writing for popular consump-

tion during the last half century of phenomenal medical progress, the profession might have retained the traditional respect and confidence of the people. Oklahoma delegates to the A.M.A. presented a resolution calling for a program of popular education.

Apparently the House of Delegates missed the point and voted to have presented annually one or two papers on the history of medicine in the section of medicine. If this resolution had achieved its purpose when presented several years ago, the sudden call for millions to be spent in the education of the public might not have been necessary.

Of all people, physicians should know that education is an evolutionary process and that it cannot be purchased and delivered in a package.

Even today the people do not know about the importance of avoiding government control and unfortunately much of the published information pro and con is being written by non-professional writers.

Aside from good writing for public consumption, physicians regardless of their chosen field should learn to set down in clear, concise form the observations they make and the scientific truths they discover. This is a duty they owe to both the profession and the people.

Since the present methods of premedical education seem not to prepare students with even the bare rudiments of good writing, it would seem wise for medical schools to consider the advisability of providing a required course in scientific writing.

With the progress of the radio, cinema and television which no matter how sound, can never take the place of the written record in the field of science, such a course seems imperative.

John H. Grider, editor-in-chief of the *Boston Herald*, says, "Of one thing I am sure—to the extent that our younger generations become illiterate by way of disinterest in reading and preoccupation with radio and non-literary visual stimuli, the foundation of our republic will be weakened." Apropos this, it is interesting to note the curriculum in early Greek schools contained three divisions, writing, music and gymnastics. According to Will Durant, writing included reading and arithmetic.

RADIOACTIVE-IODINE

In the August issue of the *American Journal of Roentgenology and Radium Therapy*, there are two interesting articles dealing with the use of this agent in the treatment of hyperthyroidism.

Wendell G. Scott[1] and his co-workers at the Washington University School of Medicine present their observations on 269 patients with hyperthyroidism treated with radioactive-iodine. Of these 195 have been carefully followed for periods varying from six months to three years. They report a satisfactory remission in 68 per cent. But 20 per cent of these now require thyroid therapy.

The authorities express the belief that their experience warrants the employment of this remedy in selected cases of hyperthyroidism. They urge teamwork and the most approved scientific methods in the selection of cases. They admit there is danger of producing hypothyroid states and that the optimum dosage should be more accurately determined.

In the same *Journal* U. V. Portmann[2] and his associates at the Cleveland Clinic report similar results after three years' experience with radioactive-iodine in 281 patients suffering from hyperthryroidism.

The chief purposes of this brief editorial comment are to call attention to this powerful new therapeutic agent which has been under consideration for approximately 10 years; to alert physicians as to its possibilities and prepare them for the questions sure to come from an inquiring public ever more curious about the successive reports of new remedies for old diseases.

1. Observations and Results in the Treatment of Hyperthyroidism with Radioactive Iodine (I131), Wendell G. Scott, M.D., William B. Seaman, M.D., Cyril MacBryde, M.D., Leo Gottlieb, M.D., William H. Daughaday, M.D., and Bernard J. Sweeney, M.D., American Journal of Roentgenology and Radium Therapy, 66:2:171 (August) 1951.

2. Experiences in the Treatment of Diseases of the Tyroid Gland with Radioactive Iodine, U. V. Portmann, M.D., Robert A. Hays, M.D., E. Perry McCullagh, M.D., and Charles E. Richards, M.D., American Journal of Roentgenology and Radium Therapy, 66:2:179 (August) 1951.

THE TREND

The leveling trend goes on, concerted effort in behalf of personal security as opposed to so-called social security seems impossible. Some day we may realize that to seek mediocrity is to murder ambition, without which life is not worth living.

Certainly doctors can never accept the inertia of universal equality. They know too much about life to be content with the annuling inevitability of a drab torpor and a decadent death.

We should do something to save our liberties and thus ease our souls. Living without courage and action is cowardice. We believe in resignation but only to God.

SCIENTIFIC ARTICLES

THE BIOPSY

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BIOPSY: Is a scientific examination of tissue derived from a living individual for purposes of determining diagnosis, prognosis and other information which may guide treatment.

Remember, *only tissue submitted can be examined and diagnosed.* Therefore, 1) the SITE of biopsy, 2) the MANNER of biopsy, 3) the AMOUNT and NATURE of the specimen and 4) the HANDLING of tissue following its removal are very important. These factors together with 5) ADEQUACY of INFORMATION furnished with the specimen, may determine whether or not the pathologist can give a definite and informative diagnosis.

The following suggestions pertain principally to neoplasms—

A. SITE OF BIOPSY SPECIMEN:

1) Try to include the edge of the lesion, selecting a *visible portion* of tissue, together with adjacent uninvolved tissue, for comparison and evaluating invasion tendency, etc.
2) A narrow deep skin biopsy is preferable to a wide shallow one.
3) *Don't* take a small bit from the center of an infected ulcerated lesion.
4) With small polyps or papillomas, try to include the base—preferably remove the whole lesion, don't take a "bite" off the top.
5) With a small solid lesion, e.g., small breast tumors, it is generally considered best to remove the entire tumor with an adequate margin of grossly uninvolved tissue. Not only does this allow the pathologist to examine multiple parts of the complete specimen, but in the event the lesion is benign, the biopsy has been curative as well as diagnostic.
6) In the case of generalized lymphadenopathy (e.g., leukemia, Hodgkin's disease, etc.) select an axillary or supraclavicular node. Avoid inguinal nodes if possible, since these often exhibit acute or residual inflammatory reaction which distorts the picture. Of course where lymph nodal metastasis from a specific focal tumor is suspected, look to the anatomic region where early metastasis is most likely to occur.

B. MANNER OF SECURING BIOPSY SPECIMEN

1) Ordinarily a scalpel is the best instrument for taking a biopsy specimen.
2) Punch type or other biopsy forceps are very useful in certain areas, e.g., cervix and larnyx, but are not adequate in most instances.
3) "Electric knives" so desiccate and distort the tissue that they should not be used unless absolutely necessary.
4) Aspiration (needle) biopsy should probably be limited to men experienced in this technique who have immediate, direct access to a pathologic consultant.

C. AMOUNT AND NATURE OF BIOPSY SPECIMEN

1) The specimen should be of such size that the nature of the various surfaces can be readily determined and the specimen *properly oriented for section.* Otherwise, angular planes of section distort relationships and may suggest "invasion" where none is actually present.
2) Necrotic bits of tissue, crusts and blood clots contribute little but confusion.

D. HANDLING OF BIOPSY SPECIMEN

1) Handle the tissue specimen *during* its removal, as well as afterward, carefully. Don't pull, tug, rub or crush. A common cause for the diagnosis, "biopsy inadequate" is the marked distortion that results from crushing with forceps or hemostats.
2) Immediately place the tissue into fixative. Delay produces drying, shrinkage and distortion.
3) The routine fixative is 10 *per cent neutral formalin** which is pre-

EDITOR'S NOTE: *This article is being published as a service to physicians at the request of the Oklahoma Association of Pathologists who feel that conformance with these suggestions will improve medical practice.*

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pared by diluting full strength concentrated formaldehyde, one part, with nine parts of water. Marble chips ($CaCO^3$) should be constantly present in the bottom of the stock container (a layer an inch or so thick) to neutralize formic acid as it forms and thus keep the formalin neutral.

Don't use formalin in concentrations of greater than 10 *per cent.* Tissue can be left in this fixation indefinitely, but staining quality begins to deteriorate gradually after the first few days.

4) Special fixatives may be necessary for special studies. There are many of these and their use depends upon the specific purpose in mind. Always use formalin fixation unless there is a good reason not to do so. Histochemical identification of *Melanoblasts* (dopareaction) in malignant melanoma depends upon identification of an enzyme and can only be done upon *fresh* tissues. Fixation in formalin must not exceed *one hour.*

E. ADEQUACY OF INFORMATION

As a consultant, the pathologist is entitled to all information that will help him to arrive at the best and most informative diagnosis. This information should include:

Patient's name, age, sex, marital status.

Tissue submitted; exact site of removal.

Brief description of lesion; clinical impression.

Brief pertinent history; extent, type and time of previous treatment, especially irradiation.

Illustrative example of *adequate* information:

Pt. Mary Doe, 36 yr. married white female.

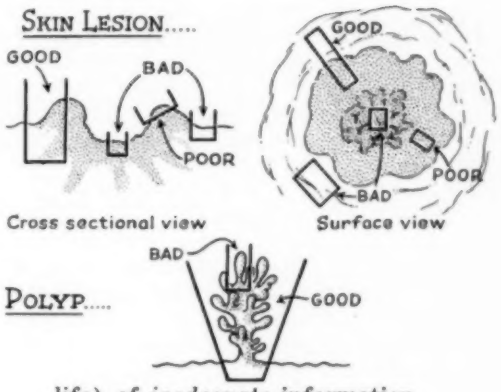
Spec. Lymph node—rt. anterior cervical.

Lesion. Node enlarged, approximately 2X, not fixed to skin.

Clin. Dx. Metastatic melanoma.

One and one-half years ago had mole from below right ear removed by a beauty operator—three mo. ago noted black specs in the skin of this area—one mo. ago patient developed cervical lymphadenopathy. There has been no recent treatment.

Illustrative example (taken from real



life) of *inadequate* information.

"Francis Doe—skin"

In this particular case the pathologist was much concerned over the histologic picture of maligant melanoma. Telephone inquiry (long distance) revealed that the patient was a six-year-old boy and so the diagnosis was made of "juvenile melanoma" — markedly altering the treatment, prognosis, etc., which would have been indicated from the original impression, "malignant melanoma." The correct diagnosis could *only* be made with knowledge of the patient's age, since the histologic picture of malignant melanoma and juvenile melanoma are identical. Similar illustrative examples could be given for requesting information as to sex, race and marital status, etc.

DANGERS FROM BIOPSY, i.e., infection, hemorrhage and spread of a malignant tumor are minimal if the procedure is done properly. Much statistical evidence indicates that proper biopsy does not influence the time or extent of metastasis except possibly in malignant melanoma where it has been suggested that the biopsy specimen should include the entire lesion with a relatively wide margin of grossly uninvolved skin.

Remember: Biopsy is often the crucial diagnostic procedure determining prognosis, method of treatment, etc. Take the best specimen you can and give the best information you can. The better the material given to the pathologic consultant the better and the more informative the diagnosis. A mistaken diagnosis is worse than none.

Incorrect diagnosis may result if the specimen is not truly representative, if it is primarily necrotic, if it presents marked inflammatory reaction from secondary infection, or if it is so small that its plane of section can not be properly oriented.

*This is the equivalent of 4 per cent formaldehyde since formaldehyde is a gas and maximum concentration in aqueous solution is 40 per cent — 40 per cent formaldehyde is synonymous with 100 per cent formalin.

HYPERPARATHYROIDISM - OSTEITIS FIBROSA CYSTICA PARATHYROID ADENOMA - WITH REPORT OF A CASE

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The parathyroid glands originate from the third and fourth branchial grooves. They are flattened, oblong nodules of brownish-yellowish color, measuring about 6 x 3 x 2 mm., and weighing around .035 gm. In the great majority of cases two superior and two inferior glands are found. The former are located on either side of the posterior aspect, upper pole of the lateral thyroid lobes; the inferior glands are applied to the lower edge of the lateral lobes, posterolateral. The glands are closely applied to the capsule of the thyroid gland and their blood supply derives from the interior thyroid artery. There may be many more than four parathyroid glands. MacCallum says that the number of parathyroid glands are as a rule in direct proportion to the "patience and persistence of the searching pathologist." Aberrant parathyroid cell nests may be found inside the thyroid gland or in the fatty and areolar tissue in the neck or in the mediastinum. The parenchyma of the glands consists mainly of principal cells some of which are clear ("water clear"), whereas others are dark. Their cytoplasm contains lipid and glycogen. In adult life oxyphile cells appear and increase in number which stain intensely with eosin and are believed to represent a degenerating phase of the principal cells. The function of the parathyroid glands is to regulate calcium and phosphorus metabolism. Calcium and phosphorus form the anorganic matrix of the bony skeleton and teeth, which constitutes their main distribution. Only one per cent of the calcium is found in tissues outside the skeleton, but the calcium ions are vital to function as they regulate the excitability of nerve ganglia and peripheral nerves, the excitability of muscles, the clotting of blood, and the permeability of cell membranes. Eighty to 90 per cent of the calcium is excreted in the feces, and 10 to 20 per cent in the urine. About 40 per cent of the phosphorus is excreted in the feces and the remainder in the urine. The normal blood calcium level equals 8-11 mg. per cent; the normal phosphorous level 3.5 to 5 mg. per cent; of further importance for the utilization of phosphorus is the encyme phosphatase, the normal blood level of which is 1.5 to four Bodanski units for its alkaline variety.

The parathyroid hormone regulates the blood-calcium and blood-phosphorus levels, together with Vitamin D which in its main component is its antagonist. Vitamin D is essential for the absorption of calcium from the intestines which of course is essential for calcification of bones and teeth. The parathyroid hormone on the other hand mobilizes calcium from bones. Its action as suggested by animal experiments and clinical observations is believed to be threefold: *First*, the hormone increases osteoclastic absorption of bone due to a marked increase in the number of osteoclasts. *Second*, the hormone increases the renal excretion of phosphates by interfering with its tubular reabsorption. The consequence of these two actions are a high blood calcium level, since much calcium is mobilized from the destroyed bones, and a low phosphorus level, since increased phosphorus is excreted in the urine. The high blood-calcium level brings with it the danger of metastatic calcification of other organs and the production of renal calculi. *Thirdly*, the hormone inhibits calcification of new bone, presumably because of its antagonistic action to Vitamin D. All these three actions of the parathyroid hormone contribute to destruction of old bone, and incomplete calcification of new formed bone. If on the other hand the action of the parathyroid glands is reduced or destroyed, there is a decrease in normal bone absorption and a decrease in the blood calcium level, which may lead to tetany.

One distinguishes primary and secondary hyperparathyroidism. Primary hyperparathyroidism is caused by functioning adenomas or more rarely carcinomas of the parathyroid glands; or occasionally by simple hyperplasia.

Secondary hyperparathyroidism occurs under two instances. First: If there is impairment of calcium or fat absorption from

the intestines such as occurs in Vitamin D deficiency, celiac disease, sprue or lack of bile, all of which produces a low blood calcium level, a reactive hyperplasia of the parathyroid glands, and secondary hyperparathyroidism may occur. The enlargement of the parathyroid glands in rickets is well known and the bone lesions of rickets or osteomalacia are due not only to lack of Vitamin D, but also to increased function of the uninhibited antagonist, the parathyroid gland. Tetany, indicating hypoparathyroidism, characteristically does not occur during the active phase of rickets, but later in the healing phase, when excessive amounts of calcium are withdrawn from the blood to be used for the calcification of osteoid.

The second type of secondary hyperparathyroidism occurs in chronic renal disease in which there is retention of phosphorus in anatomically damaged tubules. This sets up a reactive hyperplasia of the parathyroids which as noted before, tends to interfere with the reabsorption of phosphorus into the tubules, and therefore produces an increased excretion of urinary phosphorus thereby counteracting the effect of tubular damage. The hyperplastic parathyroids then exert their other functions excessively and as a consequence increased osteoclastic activity and incomplete calcification of new bone occurs and the lesions of so-called renal rickets are produced.

In hyperparathyroidism, the normal action of the parathyroid hormone is greatly exaggerated. We therefore find markedly increased osteoclastic activity throughout the skeleton, increased phosphorus excretion through the kidneys, a low phosphorus blood level and a high calcium blood level. There is consequently increased destruction of bone with general osteoporosis and focal often cystic areas of cone destruction: osteitis fibrosa cystica. However, in many cases bone formation keeps pace with bone destruction and no destructive lesions occur. In 24 cases reported by the Mayo Clinic, about one-third showed minimal bone changes, and the remaining third showed no bone changes whatever. These authors believe that many cases of hyperparathyroidism exist in a mild form, and that all cases of nephrolithiasis and nephrocalcinosis should be studied carefully for hyperparathyroidism.

Experimentally, osteitis fibrosa cystica can be produced in animals by the injection of aparathyroid hormone.

In man, the relation between osteitis fibrosa cystica and hyperparathyroidism produced by a functional parathyroid adenoma was first proved by Mandl based on Erdheims fundamental research. Mandl in 1926 was the first to remove a parathyroid adenoma in a case of osteitis fibrosa cystica, with at first dramatic results. Subsequently around 600 cases of hyperparathyroidism have been reported, the majority of which were caused by parathyroid adenomas. These adenomas are usually single, but may be multiple. They are of soft consistence, yellowish-brownish color and variable in size. Histologically, they are usually composed of principal cells; oxyphile cell adenomas have been reported but are believed to be non-functional. Most parathyroid adenomas are benign, but eleven papers deal with carcinomas of the parathyroid gland (see bibliography). It should be noted here that diagnosis of malignancy of parathyroid and other endocrine-adenomas is based on clinical rather than morphological evidence. Neither invasion of capillaries nor of capsule nor anaplasia of individual tumor cells indicates malignancy in endocrine tumors; only local recurrence, distant metastases or very marked anaplasia are suggestive of carcinoma.

Most cases occur in middle or old age, and more frequently in females. The symptoms are slow in onset but have a chronic progressive course. There is usually pain in the legs and back. Stiffness of the joints is often treated as rheumatism. Fatigue is profound. There is muscular weakness and tenderness of the bones and the muscles are flabby and atrophic, with neuromuscular hypoexcitability and muscular hypotonia. There is generalized decalcification of all the bones, often with cyst formation. Spontaneous fractures frequently are the first symptom of the disease. Deformity of the bones is often seen in the legs, chest and spine. All types of acute and chronic kidney degenerations are frequent and kidney stones and calcifications in the kidney often occur, especially in the renal type of the disease. This may be the first indication that a hyperparathyroidism exists. Disturbances of the gastrointestinal tract, such as nausea, vomiting and epigastric pain, are seen and duodenal ulcer occurs in about one-third of the cases. Anorexia is generally severe, achylia, constipation and anemia are often present. The blood calcium may be increased up to 12 to 14 mg per cent or even higher. This is especially noted in the osseous type of hyper-

parathyroidism. The blood phosphorus is generally decreased. We also see a high urine calcium and a high urine phosphorus. The normal urine calcium is 20 to 40 mg per cent per 100 c.c. and the normal urine phosphorus is one to 2.5 mg per cent per 100 c.c. Hyperparathyroidism generally progresses very slowly and lasts one to 10 years before death.

The differential diagnosis must consider the following conditions:

1. Solitary bone cysts: occur in young persons. Blood calcium and —phosphorus normal. No generalized osteoporosis.

2. Rickets (in children) and osteomalacia (in female adults) : No localized destructive bone-lesions. Blood calcium normal or low.

3. Osteitis deformans (Paget's disease) : No localized destructive lesions. Blood calcium and —phosphorus normal.

4. Multiple myeloma and bone metastases: No general osteoporosis. Blood chemistry normal with exception of increased phosphatase.

5. Albright's syndrome: Normal blood chemistry. Areas of bone replacement alternating with areas of hyperostosis. Sexual precocity, skin pigmentations.

Surgical treatment is the only treatment of value in hyperparathyroidism. All adenoma must be removed or if due to hyperplpasia of the glands, three glands should be removed and the fourth gland left. (Cope) If no enlarged glands or tumors are found search must be extended to the substernal area and anterior mediastinum even though a later operation is required.

Operation: Local, nitrous oxide or intravenuous sodium pentothal are satisfactory anaesthetics. The incision should be a low collar incision as in thyroid operation. Make a careful search of one side at a time. Adenomas are seldom palpable before operation, therefore, no clue is present as to the position or location of the tumor. Surgeons should be experienced in thyroid operations as they are more familiar with the appearance and location of the parathyroid glands. These glands are readily confused with small thyroid nodules, aberrant thymic nodules, lymph nodes and fatty tissue. Any nodule that has a vascular pedicle is a parathyroid gland. Any node or mass or suspicious nodule should be examined immediately by frozen section. If the first gland removed and examined by frozen section does not show hyperplasia of the gland, a tumor must be sought, either in the neck, thyroid gland, or in the mediastinum. About 10 per cent of all parathyroid tumors have been found in the anterior or posterior mediastinum. The calcium in the blood begins to decrease immediately after the operation and if no decrease occurs and the symptoms do not clear up or return after an interval, another adenoma probably exists and a second operation should be done.

Post-operative complications: 1. Recurrent laryngeal nerve injury. 2. Postoperative tetany due to removal of or damage to all four parathyroid glands. Daily calcium determinations and watch for clinical symptoms of tetany must be made. Calcium levels below seven mg. per cent are within the danger zone. Treatment with AT 10, calcium or parathormone must be instituted at once.

After removal of a functioning parathyroid tumor, pain is the first symptom to disappear as early as during the first week. Recalcification of the skeleton occurs slowly, spontaneous fractures heal, muscle tonus returns, but deformities remain. The hypercalcemia disappears rapidly. Osteoporosis may persist for a long time.

In reviewing the literature of hyperparathyroidism, the following points are of extreme interest. First, there exists an acute form of hyperparathyroidism often beginning with pain in the epigastrium, with nausea, persistent vomiting, weakness and lethargy. Waife reported five cases of this type and they are rapidly fatal. Second, hypertension with or without renal insufficiency may develop following the operation, even though no renal damage was found and the patient was clinically cured of the disease. Rienhoff reported in a follow-up study of his 25 operative cases, that nine deaths occurred in three to 11 years after operation, and all these were due to hypertension with or without renal insufficiency. In five of these patients, no evidence of any renal damage was found prior to operation, therefore, even though the symptoms disappear and the blood calcium and phosphorus return to normal the prognosis as to length of life has to be guarded. Renal stone, hypertension, renal insufficiency and uremia are prone to occur even in the apparently cured patient. Third, more cases of a coexisting, active or latent duodenal ulcer and hyperparathyroidism are being found.

Rogers and Keating found active or latent duodenal ulcers in three of their four cases of parathyroid hyperplasia at the Mayo Clinic. This association calls for further study as its significance is not known at this time.

CASE HISTORY

M. D., a 64-year-old woman, was brought to the office with the chief complaints of a gradual weight loss of 46 pounds during a period of 10 years, and muscular weakness. Present weight was 64 pounds. For the past two to three years, she had nocturia and polyuria and for the last six months pain and tenderness of her legs, with difficulty in walking and extreme fatigue. There has been a lump in the right tibia for four months which was tender, painful not red and gradually had increased in size. She also complained of anorexia, extreme constipation, nausea, bloating, nervousness and insomnia.

Physical examination revealed a very emaciated but alert woman who walked with diffculty. There was a slight enlargement of the lower pole of the left thyroid lobe. There was some tenderness over the ribs. Chest, cardiac findings negative. Blood pressure 160/90. Abdomen and pelvis negative. The bones of the legs were tender, and there was a small nodular egg-sized swelling in the upper third, anterior surface of the right tibia; it was not red, not fluctuant and not movable. A similar smaller mass was found in the middle third of the right tibia.

Laboratory Findings: Hemoglobin 10 gm. Rbc 3,880,000. WBC 10,000 with 55 per cent neutroph. segment., five per cent eosinoph., 40 per cent lymphocytes. Kline negative. Urine: Spec. gravity 1012; ph 6.5; album. 1 plus. Sugar neg.; Sedim. 20 to 30 pus cells hpf, gram neg. bacilli, identified as E. coli. Urinary calcium not increased. Total serum protein 5.17 gm. per cent. Serum albumin 2.69 gm. per cent. Serum globulin 2.48 gm. per cent. N.P.N. 34.8 gm. per cent. *Serum calcium* 13.2 *and* 12.4 *mg. per cent. Serum phosphorus* 2.9 *and* 2.8 *mg. per cent.* Alkaline phosphatase 2.8 and 2.8 Bodanski units. X-rays of the pelvis, legs, chest and skull showed marked, generalized osteoporosis of all bones with cysts of the right tibia and right femur (Fig. 1, 2A). Also old fractures of the seventh and eighth ribs, right side and marked bending of both femora (Fig. 1).

On August 3, 1950, biopsy of the cyst of the right tibia was done and a diagnosis of Osteitis Fibrosa Cystica and probable parathyroid adenoma was made. (See pathological report later on.). From August 4, 1950, to August 18, 1950, daily transfusions were given, also intravenous glucose, amino acids, vitamins, etc., and forced feeding by mouth. On August 17, 1950, the patient was much stronger, the hemoglobin was 11.5 grams (77 per cent) and the RBC was 3,680,000. On August 18, 1950, exploration of the neck for parathyroid tumor was done. The left side was explored first. The left lower lobe of the thyroid was enlarged but no tumor was found. Several pieces of tissue were taken for fresh tissue biopsy. No enlarged parathyroid glands were found on the left side. The right side was thoroughly explored and tissue taken for biopsy, which was negative. A small tumor was found just below and behind the sternum and tissue for biopsy taken which was positive for tumor of parathyroid. A yellow-brown, firm tumor about three-fourths in. by one and one-half in. was removed by blunt dissection (See pathological report later on). The prethyroid muscles were sutured, tissue drain inserted and skin closed. Patient was returned to her room in fair condition. She was given transfusions of 1000 c.c. whole blood daily and 1000 c.c. five per cent amino acids once or twice a day. Forced feeding by mouth, penicillin, vitamin B complex, calcium and 20 units of parathyroid extract were given every day. She had no signs of tetany but was extremely nervous at times. The only complication was an attack of ventricular fibrillation on August 29, 1950. She had a rapid gain in strength and weight and has had no complaint of pain in her legs or back since the operation. The blood calcium rapidly fell to 8.6 milligrams per cent on the third day and has varied from 7.5 to 9.5 milligrams per cent since the operation (Fig. 3).

She walked out of the hospital on October 10, 1950, much stronger and weighing 80 pounds, a gain of 16 pounds.

X-rays taken eight months following removal of the parathyroid adenoma reveal an increase of recalcification of the long bones. The texture of the bones however never quite returns to normal because the organic matrix has been considerably altered during the period of disease. The cyst-like areas

of diminished density show evidence of being filled in with dense bone (Fig. 2B). There is slight increase in the thickness of the cortex of the long bones.

Since the operation she has continued to improve, weighs 95 pounds, feels good and is in very good health at this time.

Pathological Reports follow:

PATHOLOGIC REPORT OF BIOPSY FROM RIGHT TIBIA:

Macroscopic: Submitted many small and a larger particle, 3 x 1 x 0.5 cm., of bony tissue.

Microscopic: The material presents as peripheral portions of a long bone. The periosteum is slightly thickened and often contains extensive deposits of hemosiderin. No evidence of periosteal inflammation is found. The old cortex is only rarely preserved. It is being replaced by new primitive bone of periosteal origin which at first is arranged perpendicular to the old cortical axis, but later becomes arranged parallel to it in an attempt to produce a new cortex (Fig. 4, 5). In many areas cortex as well as underlying cancellous bone are completely replaced by nodules composed of fibroblasts, capillaries and numerous multinucleated giant cells (Fig. 4-8). These nodules are surrounded by a zone of fibrosis within which there is much formation of new primitive bone and extensive deposits of blood pigment: "brown nodes" (Fig. 6).

All new bone, cortical or cancellous, is composed of bars surrounded by osteoblasts which produce a peripheral seam of osteoid. In the center, deposition of primitive osseous substance, staining purple with hematoxylin, is taking place, and within it, the osteoblasts have been converted into star-shaped young culae are on one side lined with osteoclasts osteocytes (Fig. 7). Many of these Trabeculae are on one side lined with osteoclasts destroying bone. These trabeculae are embedded in a fibrous matrix completely replacing the bone-marrow, and containing extensive deposits of blood pigment.

Comment: The focal osteoclastic destruction of old cortical and cancellous bone and its replacement by "brown nodes" composed of osteoclastic multi-nucleated giant cells, and by new primitive, poorly calcified bone, embedded in a fibrotic matrix, is characteristic for osteitis fibrosa cystica (Von Recklinghousen's disease). The brown color of the nodes is produced by deposition of blood pigment at their periphery. The absence of extensive production of primitive bone as found in the mosaic structures of Paget's disease (osteitis deformans), speaks against that disease. The presence of large nodular areas of complete bone destruction speaks against osteomalacia, in which a more gradual replacement of old bone by primitive often osteoid bone is found. This lesion is a characteristic manifestation of hyperarathyroidism and in all likelihood is produced by a parathyroid adenoma which should be searched for and removed.

Diagnosis: Osteitis fibrosa cystica (Von Recklinghousen's disease). Suspicion of parathyroid adenoma.

PATHOLOGICAL REPORT OF PARATHYROID TUMOR

Macroscopic: Submitted a well encapsulated oval-shaped tumor weighing seven grams and measuring 4 x 2½ x 1 cm. The tumor is distinctly lobulated and of very soft consistence. On cross-section the tumor stroma is homogenous and salmon colored. In the center, however, an oval shaped sharply outlined area is found, which is brownish-colored and has a surrounding yellowish zone. At the periphery the tumor stroma also has a slight yellowish tinge (Fig. 9).

Microscopic: The tumor is composed of fairly uniform large polyhedral cells arranged in large solid sheets and nests, and occasionally lining acinar or tubular structures (Fig. 10). The nuclei of the tumor cells are vesicular with finely granular chromatin and well visible nucleolus. Occasionally, large hyperchromatic nuclei are found and rarely mitoses are seen. Some nuclei are enlarged, hyperchromatic and pyknotic (Fig. 11). The cytoplasm shows considerable variations in structure. In most tumor cells it is abundant, slightly acidophilic, finely granular and containing small droplets of lipid. The granules present as glycogen in special stains which is arranged at the cell periphery. Clear, "wasserhelle" cells are found rarely. There are scattered nests of larger distinctly eosinophilic cells which may or may not be granular. All gradations are found from a non-staining vacuolated cytoplasm to markedly eosinophilic cytoplasm. The majority of cells shows moderate eosinophilia and fine granularity. The cell boundaries are very distinct. A large number of capillary and small blood vessels are found between the tumor cell-sheets, the capillaries being directly surrounded by tumor cells (Fig. 10). The tumor shows exceedingly little supporting stroma and that only around the larger blood vessels, in the form of thin strands of connec-

tive tissue. In the center extensive apparently degenerative changes are found in the form of large spaces filled with amorphous precipitated liquid material. Within these spaces small nests and groups of well staining tumor cells are seen, and at their periphery one sees disintegration of tumor cells, a process which eventually leads to the formation of these spaces. Within and around these spaces one sees numerous phagocytes filled with hemosiderin. The tumor is well defined and surrounded by a thin capsule.

Diagnosis: Chief-cell adenoma of parathyroid gland.

SUMMARY

The anatomy and physiology of the parathyroid glands, and the nature, causes, clinical picture, differential diagnosis and treatment of hyperparathyroidism is discussed. The case of an elderly female patient is presented in whom a clinical, roentgenological and biopsy diagnosis of osteitis fibrosa cystica was made, and an adenoma of a parathyroid gland found and removed, following which there was a dramatic recovery with prompt return of the previously high blood calcium levels to normal, ossification of destructive bone lesions, and regain of the previously lost 30 pounds of body weight within a few months.

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MEET OUR CONTRIBUTORS

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John C. O'Leary, M.D., Richard D. Haines, M.D., and *W. Thomas Jay, M.D., Temple*, Texas, have an article on Arterial Insufficiency in this issue. Doctor O'Leary is resident in medicine at Scott and White Memorial Hospitals; Doctor Haines is with the department of Medicine, Scott and White Clinic; and Doctor Jay was formerly resident in medicine, Scott and White Memorial Hospital, and now in the U. S. navy.

HEMOPTYSIS - 70 CASES

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The occurrence of the expectoration of a teaspoonful or more of fresh blood sends the victim to his physician without delay. As diagnosis depends upon keeping in mind the various causes of pulmonary bleeding, a group of 70 cases seen in private practice in a rural area is surveyed with the idea of ascertaining the most probable causes. Not included in this tabulation are instances of the bloody sputum in the early pnemonias, and those of the sanguinous froth in left ventricular failure.

The table shows that, as might be expected, pulmonary tuberculosis in some form is the most common cause of hemoptysis, with instances. This includes both previosly known and unknown cases of which some had several attacks, although only each individual is tabulated. Those persons whose tuberculosis is ushered in by the appearance of blood are fortunate; they usually fare well if the proper treatment is accepted. When cavernous changes and bilateral involvement have taken place the outlook is of course poorer. The amount of blood lost is usually small, although fatal hemorrhages can occur from blood vessels in rigid cavities and in scarred bronchial tracts.

Metastatic malignancy is the second most common cause of hemoptysis, with 10 instances. It may happen that bleeding may be the first symptoms of the primary growth, even though it may be located elsewhere. Any malignancy which is capable of metastasizing to the lung may be the cause, although in this group carcinomas of the breast and of the kidney comprise seven; the others are from the esophagus, prostate, and one unknown.

Vascular accidents from thrombi presumably located in fibrillating auricles are the apparent cause of nine of the cases. It is of some interest that all of these patients suffered from old rheumatic heart disease in some form. It is not claimed that fibrillation from other causes is not capable of causing indirectly at least embolic phenomena in the lung, but it was not seen in this group. It is also of interest that in a series of 55 instances of myocardial infarction no pulmonary embolism was recognized.

These three conditions just mentioned account for about one-third of the total number. The remainder is divided between a widely dissimilar group. Trauma is an obvious cause (six cases) and offers no great diagnostic difficulty. Highway and farm accidents and gunshot wounds account for most of these.

Bronchiectasis was seen, also, in six cases. The diagnosis is sometimes not easy to confirm, and bronchograms must be made in most of the cases, especially those with less conspicuous physical and X-ray findings. Bronchiectasis is a most common disease, especially in the older age group.

Blood dyscrasias were seen in four of the series, and were respectively leukemia, thrombopenic purpura, aplastic anemia, and dicumarol effect. All of these persons had bleeding elsewhere in addition, but in only one (dicumarol) was the bleeding fatal.

Lung abscess from any cause will some time in the course of the disease produce some bleeding, perhaps a rather copious amount. Primary cancer of the lung is not seen, or at any rate, not recognized, with any frequency in this locality, and was proven only three times in the group in question by pathological examination. Three instances of postoperative pulmonary embolism, all non fatal, were seen, and recovered spontaneously. The fatal cases with a large vessel occluded do not as a rule bleed; death takes place too abruptly. Foreign bodies (a pin, and a piece of cancellous beef bone) produced expectoration of blood in two cases. One instance each of lingual varix, of carcinoma of the pharynx, and of inhalation of cement dust was seen.

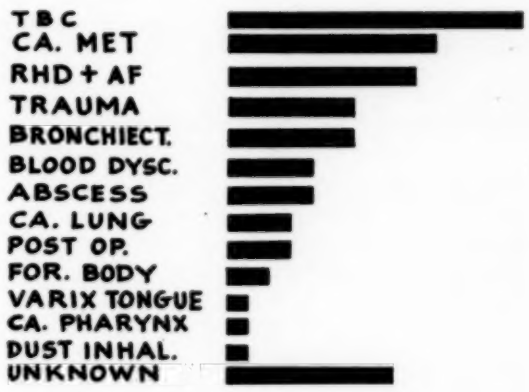
Eight persons with hemoptysis, in most cases repeated, remain undiagnosed. Bronchograms, bronchoscopy, and all other ordinary procedures have failed to reveal a cause. In none of them was the hemorrhage extensive enough to cause much trouble, but it is frustrating to both patient and physician to be unable to establish some reason

*Presented before the Section on Medicine at the Annual Meeting of the Oklahoma State Medical Association, May 21, 1951.

for bleeding; in one individual it was the direct cause of a reactive depression. None of these people, so far as it known at this time, have been given a tenable diagnosis, and none have come to physical harm from the bleeding.

The diagnosis of the cause of pulmonary bleeding rests largely on X-ray findings and on other appropriate laboratory and pathological procedures. Ordinary physical examination of the chest is of little value other than disclosing the presence of tracheal fluid. Perhaps this maneuver is becoming a lost art. It is indeed impossible at times to determine which side the bleeding is from, and the opinion of the patient is often of value.

The treatment of the attack is directed toward rest and quiet. There are no commonly available means of arresting the bleeding, in a manipulative way. Sedation with some opiate other than morphine (it causes nausea too frequently) is desirable both for physical and psychic rest, as the patients are upset emotionally more than somatically. There is no rational reason for applications of icebags to the chest; it is difficult to see how the effect of cold could penetrate through the chest wall and cause significant changes in the bleeding vessel. Most pulmonary bleeding will stop before much harm is done. No fatalities directly due to blood loss from the lungs, with the possible exception of the instance of dicumarol effect, were seen in this group. Free bleeding from malignant or ulcerated areas cannot be stopped by non surgical means and transfusions of blood are of equivocal value. Pneumothorax was in the past employed by the writer to arrest pulmonary bleeding, but is considered to be of no great worth, even when the affected side can be identified.



Distribution of Causes of Hemptysis in 70 Cases.

The prognosis of the immediate attack is generally good, although it is recognized that at times fatal exsanguination may occur. The amount of blood lost is not necessarily an index to the extent of the underlying disease.

SUMMARY

Seventy cases of hemoptysis are reviewed with the thought of determining the most common causes. One-third of the cases are due to tuberculosis, metastatic carcinoma, and to vascular accidents as a result of auricular fibrillation.

SUMMARIES ASKED FOR SCIENTIFIC PAPERS

All members of the Association who desire to present papers on the Scientific Program at the 1952 Annual Meeting are invited to submit summaries of their papers to the Scientific Work Committee for consideration, before January 15, 1952.

The number of papers which can be used is necessarily limited. Those submitted will be considered by the Committee on the basis of scientific quality, interest and adaptability to the program as a whole.

Summaries should be addressed: Charles M. O'Leary, M.D., Chairman, Scientific Work Committee, 1227 Classen, Oklahoma City, Oklahoma.

ARTERIAL INSUFFICIENCY WITH EMPHASIS ON THE TREATMENT OF ACUTE ARTERIAL OCCLUSION

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Until recently the field of peripheral vascular disease has failed to stimulate the interest of the medical profession. There remains a tremendous challenge to discover the altered chemicophysiological pathology preceding the development of the clinical syndromes recognized as Buerger's disease, Raynaud's disease, and arteriosclerosis obliterans. These clinical patterns are well established, and it behooves us to recognize them promptly. With the growing population and the ever increasing geriatric community, early diagnosis of peripheral arteriosclerosis obliterans and the intelligently applied measure preventing its progression and complications are of prime importance. The occurrence of a sudden peripheral occlusion due to peripheral vascular disease can without hesitation be termed a "medical emergency," and demands the cooperation of a special team composed of internists, anesthetists and surgeons. In presenting this paper we wish to re-emphasize the various points of diagnosis of the most common causes of arterial insufficiency and to outline our plan of therapy for handling acute arterial occlusion.

The classification of chronic arterial insufficiency has been proposed by Oschner and DeBakey and is presented in Table 1. We have elected to follow it basically as it takes into consideration two important features inherent in the underlying disease process, namely: (1) vessel spasticity, and (2) structural changes due to the obliteration of the vessel lumen. Diseases causing chronic arterial insufficiency frequently form the basis of acute arterial occlusion. These diseases are also listed in Table 1. Other possible causes of acute occlusion are given in Table 4.

The two most frequent diseases associated with chronic arterial insufficiency are thrombo-angiitis obliterans and arterio-sclerosis obliterans. The diagnostic features characteristic of each are listed in Table 2. When the patients are within the prescribed age limits and have other associated findings, the diagnosis is obvious. There remains, however, a group of patients whose initial symptoms occur during the fourth decade but they fail to have other definite confirmatory signs or symptoms of either disease, and the differential diagnosis remains uncertain. It seems more important to propose a plan of therapy for this group of patients rather than debate the underlying disease process.

Routine observation of patients showing initial symptoms must be made. They must stop smoking entirely, and they must be instructed in routine hygenic care of the extremetries. The methods of Buerger's exercises should be explained to the patients; and if they are financially able, it is thought that the nightly use of Sanders's oscillating bed is indicated. Drugs such as nicotinic acid, Priscoline, and theobromine may be used for their vasodilating effects.

Several methods for estimating the degree of arterial insufficiency are available. There is always a tendency to develop and rely upon special investigative apparatus for determining diminution of arterial flow. This certainly has its value. For clinical medicine, however, the conscientious attempt to elicit an accurate history of claudication, to palpate the peripheral pulsations, plus the notation of extremity temperature changes and effects produced by elevation and dependence of the extremities will produce sufficient evidence to be certain of decreased arterial flow in a large majority of instances. The diagnostic methods in the determination of arterial insufficiency, both acute and chronic, are found in Table 3.

Acute arterial occlusion demands early recognition and prompt institution of proper therapy. Table 4 tabulates the etiological factors involved in producing thrombosis and embolism. Throughout the rest of this paper arterial emboli will be arbitrarily discussed; however, arterial thrombosis will at times produce the same clinical picture.

The physiological events subsequent to arterial embolism should be understood in order to apply rational therapy. As listed by Haimovici, three main events occur following an arterial embolus: (1) vasospasm of the segment of the vessel distal to the oc-

clusion and of the collateral vessels; (2) secondary thrombosis proximally and distally to the original embolus; and (3) development of structural changes within the arterial wall at the site of the embolus.

The cardinal signs and symptoms of acute arterial occlusion are easily recognized. There is pain in the extremity varying from sudden numbness to sharp, severe pain, depending upon the site of the occlusion. Pallor develops in the skin of the extremity, followed by a decrease in the skin temperature of the affected limb. There develops a loss of sensation, loss of superficial pulsation of the arteries and collapse of the veins. The development of a cyanotic discoloration usually indicates that gangrene is impending. There may be marked tenderness on palpation over the site of the embolus.

As will be noted in Table 3, certain diagnostic procedures such as the use of the histamine wheal test, oscilometric graphs, and phlethysmographic readings are included. Although these procedures have been and are used to determine the extent of the area involved by an acute occlusion, it is not thought that they add enough information, which cannot be secured by careful physical examination, to warrant their routine use.

Primarily, the medical therapy of acute arterial insufficiency is directed toward the maintenance of adequate blood flow to the affected limb, trusting to avoid later amputation. Other measures simultaneously instituted are directed toward the relief of shock, if such exists, and to the relief of pain. As Table 5 shows, therapy consists of the simultaneous use of drugs and other measures to limit permanent damage of the extremity below the site of the occlusion to as small an area as possible. In acute arterial occlusion pain may vary considerably, and when it is severe, large doses of opiates are necessary. If the patient is seen relatively soon after the mishap, within the first four to six hours, full medical therapy is instituted. Vasodilator drugs are given, including papaverine, gr. 1 to gr. iii, intravenously, at intervals of every two hours. The other drugs listed, Priscoline, Etamon, and whiskey, are not thought to produce enough vasodilation to warrant their substitution for papaverine.

Special care is taken regarding the position and the environmental temperature of the affected limb. This is to insure that no added burden of either dependency or elevation is placed upon the diminished blood flow of the extremity, and that the metabolism of the tissues of the extremity is maintained at the level which is most compatible with the reduced blood flow. Many patients complain of foot discomfort caused by tightly tucked bed sheets. The use of a foot cradle will avoid this situation.

Until a recent date certain groups have favored the application of heat or refrigeration. Realizing that refrigeration increases the already present vasospasm, and that heat increases the local tissue metabolism, an attempt has been made to keep the affected limb at a relatively even "room" temperature (85 to 95 degrees F.). Measures are applied to the unaffected limbs which might cause reflex dilation of the vessels of the affected limb without producing acceleration of the metabolism of the tissues of this limb. If circulation is unimpaired in one or more of the unaffected extremities, mild heat may be applied to them by means of heating pads or hot water bottles in the hope of creating reflex vasodilation. Heat may also be applied to the abdomen and the sacral region with the same idea in mind, and may be used in these areas if there is impairment of circulation in the unaffected extremities. When heat is applied in the above mentioned areas, it is not used continuously, but is applied several times a day for from 30 to 60 minutes at a time.

The importance of the use of anticoagulants has been established. They are used if the patient is seen directly after the occlusion, and more often after some surgical procedure such as embolectomy. Heparin should be used at first if there is a possibility of surgery because it may be controlled more definitely than dicumarol. A change to dicumarol may be made after sufficient time has elapsed and improvement has indicated that surgery will not be required. In taking an arbitrary stand, a patient subjected to surgery may be shifted to dicumarol 12 to 24 hours after surgery, if no contra-indication exists. Anticoagulant administration should be continued for some seven to ten days after adequate response to medical therapy or surgery. In small hospitals where the prothrombin time can not be determined, heparin may have to be used entirely. Because of insufficient experience with the use of epsilan phosphate and calcium gluconate, their effectiveness has not been evaluated.

When heparin is used, it is given intramuscularly every four hours in 50 mgm. doses. It can also be used in 100 mgm. amounts every six hours, or intramuscularly

once a day in the form of Depoheparin, 300 mgm. daily. It is thought that the four hour from heparin to dicumarol, a preliminary prothrombin determination should be made. If this approaches 100 per cent of the control, 300 mgm. of dicumarol is given. The amount of dicumarol given on successive days is regulated by the prothrombin time determined daily prior to the administration of the dicumarol. If the prothrombin time is above 50 per cent of the control, 100 mgm. of dicumarol is given; if it is above 30 per cent of the control, 50 mgm. of dicumarol is given. The object of this is to keep the prothrombin time between 20 per cent and 35 per cent of the control reading. When the prothrombin time approaches 35 per cent of the control, the heparin is discontinued. The action of the dicumarol may be somewhat erratic in some patients, and the above dosages may have to be adjusted to suit the individual patient.

Lumbar sympathetic block is done on the affected side at the level of the second lumbar ganglion, using 20 c.c. of two per cent procaine. At times an indwelling catheter is inserted through the needle used in accomplishing the block and is left in place when the needle is withdrawn. Five c.c. of two per cent procaine is injected into this catheter every two hours, and thus a continuous block may be maintained. Although we have not seen any untoward effects from this procedure, the possibility of bleeding at the site of puncture or around the catheter must be considered when the clotting power of the blood has been reduced by the use of adequate amounts of anticoagulants.

This plan of medical management is followed for six to eight hours or longer if there is any evidence of the return of adequate blood flow. If there is not any evidence of the return of the flow of blood through the affected limb, embolectomy is then advised. The success of therapy is determined by the return of the more normal temperature to the limb, the return to a color approaching that of the unaffected limb, and in some cases by the return of peripheral pulsation. Due to the greater collateral circulation present, more adequate and rapid return of circulation can usually be expected in occlusion involving the upper extremity.

It must be remembered that very frequent observation is necessary to determine what progress has been made and what additional steps should be taken. In acute arterial occlusion it is not felt that sympathectomy is of great value. Sympathectomy may be considered when the active process has become stabilized and the general condition of the patient is improved. Sympathectomy has been done to lower the site of any necessary amputation. A favorable response to sympathectomy may be expected in selected patients with chronic arterial insufficiency.

TABLE 1

Causes of Chronic Arterial Insufficiency:

I. Vasospastic Funtional
   A. Raynaud's Disease per se
   B. Raynaud's Syndrome (cervical rib-scalenus anticus-hyperabduction)
   C. Acrocyanosis
II. Vasospastic Organic
   A. Thrombo-angiitis Obliterans
   B. Ergotism
III. Organic Degenerative
   A. Arteriosclerosis Obliterans
   B. Periarteritis Nodosa
IV. Miscellaneous
   A. Chronic Pernio
   B. Scleroderma
   C. Lupus Erythematosus

TABLE 2

Differential Features of Thrombo-Angiitis Obliterans vs. Arteriosclerosis Obliterans

Thrombo-Angiitis Obliterans:

1. Onset before age 40 years.
2. Occurs almost entirely in males.
3. Hypertension not common.
4. Diabetes mellitus rarely found.
5. Blood cholesterol is normal.
6. X-ray vessels negative for calcification.
7. History of migratory superficial thrombophlebitis.
8. May involve upper extremities as well as lower extremities.
9. Patient is usually a heavy smoker.

Arteriosclerosis Obliterans:

1. Onset after age 50 years.
2. Occurs in females as well as males.
3. Hypertension is a common finding.
4. Diabetes mellitus is commonly present.
5. Blood cholesterol is commonly elevated.
6. X-ray evidence of calcification of thigh vessels is a common finding.
7. Migratory phlebitis not associated with underlying disease process.
8. Limited to lower extremities almost entirely
9. Patient often exhibits other signs of arterial change, either cerebral or coronary.

TABLE 3

Diagnostic Methods
For Determination of Arterial Insufficiency

I. History
  A. Paresthesia in the extremities
  B. Pain
    1. Intermittent claudication
    2. Acute
    3. Ischemic neuritis
  C. Ulceration
  D. Gangrene
II. Physical examination
  A. Skin and nail changes
  B. Skin temperature alterations
  C. Changes in arterial pulsations
  D. Postural color changes
  E. Vein filling time with dependent position
  F. Exercise tolerance determination
III. Laboratory
  A. Arteriography
    1. Detection of arterial calcification
    2. Intra-arterial injection of radio-opaque substances
  B. Blood chemistry
    1. Determination of blood sugar
    2. Determination of blood cholesterol
    3. Hematocrit
IV. Miscellaneous
  A. Histamine wheal test
  B. Skin temperature recordings
  C. Oscillometric graphs
  D. Plethysmographic readings
  E. Response to Sympathetic interruption (surgically or medically)

TABLE 4

Causes of Acute Arterial Insufficiency

Embolism:
1. Rheumatic heart disease
  a. Valvulitis
  b. Fibrillation
  c. Subacute bacterial endocarditis
2. Arteriosclerotic heart disease
  Myocardial infarction with mural thrombosis
3. Congenital heart disease
  Subacute bacterial endocarditis
4. Peripheral vascular disease
  a. Arterial
    (1) Arteriosclerosis
    (3) Trauma
    (3) Inflammation
    (4) Aneurysm
    (5) Mural thrombus
  b. Venous
    Embolus from site of origin in venous system through a patent formamen ovale into the arterial system

Thrombosis:
1. Arteriosclerosis obliterans
2. Trauma
3. Surgical procedures
4. Thrombo-angiitis obliterans
5. Acute infections causing arteritis
6. Blood dyscrasias
7. Heart failure
8. Periarteritis nodosa
9. Infectious diseases
10. Idiopathic thrombophilia

Plan of Treatment of Acute Arterial Embolus

TABLE 5

I. Relief of pain
  Analgesics as necessary (codeine, papaverine, demerol)
II. Maintenance of adequate peripheral blood flow
  A. Medical
    1. Vasodilator drugs
      a. Priscoline
      b. Etamon
      c. Papaverine intravenously
      d. Whiskey
    2. Special care regarding position and temperature of involved limb
    3. Use of anticoagulants
  B. Surgical
    Sympathetic block
III. Embolectomy

SUMMARY

The causes of arterial occlusion both acute and chronic together with points of differential diagnosis have been presented in outline form. Also, the differential diagnosis of arteriosclerosis obliterans and thrombo-angiitis obliterans, the two most common causes of arterial occlusion, has been given. A mode of medical treatment for acute arterial occlusion by means of drugs, sympathetic nerve block, and supportive measures has been presented. It has been noted that a favorable response to sympathetomy may be expected in selected patients with chronic arterial insufficiency.

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THERAPEUTIC CONFERENCE*

THE UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE
Presented by the Departments of Pharmacology, Pediatrics and Anesthesiology

RESUSCITATION

PAUL W. SMITH, PHD., HENRY G. STRENGE, M.D.,
AND HOWARD A. BENNETT, M.D.,
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DOCTOR SMITH: Broad speaking resuscitation refers to the restoration of adequate circulation or respiration in a patient in whom these functions have become severely depressed. Even when one or both have stopped completely, restorative measures should be instituted promptly because it is well known that respiration, particularly, has resumed in normal fashion as the result of artificial respiration after many minutes or even hours. Depression of either circulation or respiration can be a primary effect. For instance, the circulation may become inadequate due to the direct loss of blood from the circulatory system by hemorrhage or to the loss of plasma as in traumatic shock (also referred to as secondary or irreversible shock). The circulation also fails when the heart fibrillates or stops due to accidental electric shock or the action of certain toxic drugs. Respiratory depression can also be a primary phenomenon—as when the muscles of respiration are paralyzed by interruption of their motor nerve supply in bulbar poliomyelitis or when the nerve endings themselves have been blocked by overdosage with curare or a related drug.

In the majority of instances, inadequacy of the circulation or respiration involves a depression of the nerve centers located primarily in the medulla and spinal cord which control these functions. The causes of such depression of the controlling centers are many. Some of the more common ones are: accidental poisoning by the potent depressant drugs, anoxia due to near-drowning, toxins which accompany acute infections and damage to the respiratory center during such illnesses as are accompanied by uremia. If we omit surgical shock from our discussion today, most of the emergencies to be dealt with are respiratory in nature. A little later in the discussion Doctor Bennett will deal very briefly with some of the cardiovascular emergencies which are encountered in connection with anesthesia.

The method of resuscitation which is chosen in any particular case depends upon the cause of the depression, if it is known, and the expected duration of the depressed state. There are many instances in which only an initial stimulus is required to reinitiate the process of normal breathing, whereupon the process may be expected to continue in any essentially normal manner. In this type of case, the restorative measure chosen may consist of a single administration of a short acting stimulant drug or a brief period of artificial respiration either by manual or mechanical means. In cases where the depression is known to be the result of a drug which is slowly eliminated and therefore likely to have a long duration of action (as an example we may mention the long-acting barbiturates) the restorative may consist of a stimulant drug given at repeated intervals, or of artificial respiration by mechanical means extending over a long period of time.

Whatever the cause, all of these respiratory emergencies have one aspect in common, and that is the necessity for speed in restoring adequate oxygen intake. Anoxia of severe degree will cause irreversible changes in the cerebral cortex in eight minutes or less. Complete anoxia would cause irreparable cortical damage in from one-half to one minute. The medullary centers, on the other hand, can withstand a fairly severe degree of anoxia for as long as twenty minutes. Somewhere in that span between eight and twenty minutes, there exists the possibility of resuscitating the patient and re-establishing normal respiration, but with the danger that when that patient recovers from the immediate emergency he will show the effects of permanent damage to the cerebral cortex. This chance of resuscitation with some degree of residual damage is of extremely great importance in the newborn because he faces a lifetime of potential im-

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pairment if the restorative process is not carried out in time.

Doctor Strenge will open the discussion by speaking of resuscitation in the newborn.

DOCTOR STRENGE: *In dealing with the* problems of children one meets a number of situations which require prompt restorative action, but the most common of these prevail in the delivery room. You will notice that I referred to children, not Pediatrics, because it is rather seldom that the pediatrician is on hand to meet these emergencies except when they can be predicted in special cases, such as prematurity or caesarean section. Most often the responsibility for meeting these situations falls on the obstetrician or general practitioner who delivers the baby, and he must be equipped to meet it.

We might re-emphasize the importance of these emergencies and the frequency of the damage which results by calling attention to the recent publicity in connection with the new spastic institute. In other words, this is a problem which is not confined to the Medical School or the Hospital, but one which has become a public matter as well. Also, it is a problem which has been the subject of as much dispute as any other in the field of Medicine, and in number, the proposed methods for resuscitating babies exceeds almost any other therapeutic measure which you could mention off-hand.

Perhaps the first rule to be applied in the resuscitation of the newborn, when he needs it, is "not to do any harm." In the first place, remember that most babies breathe spontaneously; that the baby is blue when he is born, and he is blue in the uterus. Stop to consider his intra-uterine oxygen relationships and you'll realize that the normal situation is one of cyanosis. So, if the baby is blue at the moment of delivery, don't be alarmed. If he does not start breathing immediately then you have reason to begin to worry. It is at this point that one begins to encounter widespread differences of opinion with respect to the proper technique.

You are perhaps familiar with the technique which consists of the application of oxygen under intermittent or steady pressure through a mask tightly applied over the infant's face. This method has several disadvantages, one of them being that it is possible to drive secretions down into the tracheobronchial tree and thereby aggravate the obstruction; the other, that ill-considered use of pressure by this technique may result in over-inflation of the alveoli, rupturing them and causing pheumothorax or extensive emphysema. More often, perhaps, the result is simply to over-distend the stomach with air and to embarrass respiratory motions as a result. I believe that the majority of those who have worked with infants feel that it is wiser simply to allow oxygen to diffuse over the infant's face so that the atmosphere that he does inhale will contain a higher oxygen concentration. If it appears that a higher oxygen concentration should be available within the lung itself the wisest measure probably consists of passing a tracheal cannula. The ideal way of doing this is under direct vision, using an infant laryngoscope, and this instrument should be a part of the equipment of every delivery room. In this way it is easy to see the opening between the vocal cords and a small catheter can be passed without difficulty. Two things are then done: first, suction is applied to clear out any possible obstruction, although it is really rather unusual to find actual obstruction there; then infusion of oxygen through this catheter into the tracheobronchial tree is begun. Here again one encounters differences of opinion but I believe that most authorities agree that this oxygen should be delivered at reasonably low pressure. The most commonly quoted upper limit of pressure is 12 cm. of water, Such a pressure may not be sufficient actually to inflate the alveoli to any great extent, but it will be sufficient to get oxygen well down into the tracheobronchial tree and in practically every case that is sufficient. Pressures exceeding the figure mentioned are all too likely to result in alveolar rupture or even rupture of the trachea—and we have seen such accidents which have occurred when unwise pressures were used.

In order to regulate the pressure at which oxygen is applied, some have used a simple Y-tube, occluding the side-arm intermittently with the finger, feeling that they can adequately control pressure in this way. I am not sure that the finger tip is a sufficiently sensitive instrument for judging the pressure at which oxygen is delivered from the tank to the infant lung and it would not be at all difficult to build up quite high pressures if an obstruction existed where the tube passes between the vocal cords. It is much wiser to have some sort of automatic blow-off or pressure regulator. These are commercially available in the form of weighted safety-valves, but it is quite easy to make one consisting of a T-tube with the lower end dipping 12 cm. below the surface of water in a bottle. Certainly this kind

of instrument can be on hand in any delivery room, and I believe it should be part of the standard equipment for intratracheal administration of oxygen.

A recent article in the *J.A.M.A.* quoted a very much lower figure, namely, two and one-half cm. of water, as the safe margin for oxygen administration to infants. It is claimed that this pressure will provide oxygen sufficiently far down into the tracheobronchial tree and in the series reported, very good results were obtained in resuscitation at this pressure. The authors described one additional refinement in their technique which sounds as if it might be an excellent one. An outer tube was passed through the glottis under direct visualization. Then a double tube was passed, the inner-most one being a small catheter with which to aspirate and clean out the trachea. After the two inner-most tubes had been removed they were able to insufflate oxygen under this low pressure through the relatively large outer tube, thereby avoiding repeated passage of the catheter in and out of the trachea which might otherwise have been necessary in the process of clearing the air-way, and which might well result in a certain amount of damage to the larynx, including laryngeal edema. Laryngeal edema due to trauma at this time may produce obstruction six or eight hours later and constitutes a definite hazard. Most workers think it unwise to introduce catheters into the trachea routinely.

Various drugs have been advocated for initiating respiration in infants, but they are criticized by many who point out that the respiratory center has already been overstimulated by its natural stimuli, namely, anoxia and carbon dioxide, and that it is in a non-reactive state. Therefore, the administration of stimulant drugs, such as caffeine, alpha-lobeline and coramine are thought to be, in most cases, quite valueless. On occasion some one of these drugs causes the infant to give a single sudden gasp, which may inflate the lungs sufficiently to make artificial respiration possible. Generally speaking, the usual stimulant drugs are valueless otherwise. Later on in the first day of life, the child's respirations may slow down and caffeine may be of some value in stimulating them. Carbon dioxide should be considered as simply another stimulant. It is probably a safer one than alpha-lobeline or coramine, but it has no particular value in severe asphyxia, because it is already present in more than adequate quantities. It may be of some value later in the course of the first few days of life to secure more complete expansion of the lungs.

The Drinker respirator has been tried repeatedly and has been found to be of little value. A number of cases of alveolar rupture have been traced to it, but in most instances, because the infant is so light, the Drinker respirator simply slides the infant back and forth on the mattress instead of producing any appreciable respiratory exchange. Many hospitals have purchased them, and most of them are assigned to back rooms where they are seldom seen. There is one technique of resuscitation which is very new and which I should mention although it is not available to us as yet. This is the Bloxsom air-lock. It is called an air-lock, because it is not a respirator although superficially it looks somewhat like one. It is a closed box in which pressures can be accurately controlled. It is so designed that the pressure starts off at one pound per square inch and is raised over a period of about 30 seconds to three pounds per square inch. The pressure is then allowed to drop abruptly back again to one pound per square inch. Usually the gas within the air-lock contains about 50 per cent oxygen. This device has several interesting effects. With a sudden release in pressure, the gas within the tracheobronchial tree expands rather suddenly and drives secretions out of the trachea and naso-pharynx. Also, by means of this alternating change in pressure every 30 seconds, there is a diffusion of gas in and out of the tracheobronchial tree. Under the higher pressure the gas is compressed. Therefore, more oxygen is driven down into the tracheobronchial tree. Release of the pressure allows the gas to expand again and come out of the tracheobronchial tree carrying with it some carbon dioxide. It is not in any sense an imitation of normal respiration; there is no alternate compression and relaxation of the chest nor any attempt to move the diaphragm. In fact, it is thought that most of the benefit occurs simply because of diffusion across the tracheobronchial mucosa, possibly also through the alveoli and probably to a considerable extent through the skin. It has a great advantage in that the infant is placed in the air-lock immediately upon delivery with no preceding manipulations so that he is protected against some of the trauma to which he might otherwise be exposed. The results which have been reported sound about as good as those obtained with other techniques—perhaps even

better. It has been accused of producing some pulmonary hemorrhages but this is denied by other people who have worked with it to a considerable extent. It would obviously aggravate any case of intracranial hemorrhage and should not be used in such cases. A differential diagnosis might be difficult, but whether its disadvantage on that account outweighs its other advantages is as yet uncertain and needs further study. We hope we will be able to secure one to see how it works here. It is not a piece of equipment which one would expect to find in a very small hospital. Its expense would probably preclude its use except in a fairly large center, but it is extremely interesting to see a really new departure in the field of resuscitation of the newborn.

DOCTOR SMITH: I have asked Dr. Bennett to discuss respiratory emergencies in the adult. Such emergencies are certainly not peculiar to the experience of the anesthesiologist, but because he is constantly called upon to administer potent depressant drugs, he undoubtedly sees more patients in a state of near-collapse than do those who practice the other specialties.

DOCTOR BENNETT: Perhaps we should say that the anesthesiologist is continuously exposed to resuscitation in that the patient who is anesthetized is being maintained in a state of profound depression; sometimes more so than we would prefer. It is important to remember that most people who need resuscitation are incompetent to take care of their own air-way. In addition, their ability to perform adequate respiratory movement is frequently impaired. We are, therefore, frequently exposed to two types of respiratory difficulties in which resuscitation is needed. First, we must give attention to the establishment of an adequate air-way, whether it be by removing foreign material, or shifting the displaced tongue forward from the posterior pharyngeal region, either by the fingers or a suitable device. Sometimes the need for clearing the air-way extends far down into the tracheobronchial tree, but this is not too common. If the patient is unable to ventilate himself properly after a decent air-way has been established, then he should be ventilated artificially by any one of several means depending upon what is immediately available; one may have equipment or one may be working only with his hands. In addition, fortunately, man is equipped with a most useful device for performing artificial respiration — i.e., his own lungs. Mouth-to-mouth respiration is a useful means of performing artificial respiration in almost any emergency. If you are fastidious, and most of us are, a handkerchief or gauze square can be interposed between the mouth of patient and physician. Next, attention should be directed to the patient's circulatory system because oxygen requires transport to the tissues from the lungs. If the circulatory system is not functioning correctly then it should be restored to a satisfactory functional status, and that is the final step in resuscitation.

DOCTOR SMITH: There are a number of methods of performing manual artificial respiration. I will introduce some of them by name and describe them briefly, and I should like for Doctor Bennett to expand on this matter a little later. A very interesting article in the *J.A.M.A.* for December 23, 1950, by Gordon, Fainer and Ivy, compared a number of methods of manual artificial respiration with respect to their efficiency in promoting pulmonary ventilation. The experiments in which the various methods were evaluated were done upon anesthetized patients and also upon cadavers before rigor mortis had set in so that the chest cage retained approximately its living state of elasticity. It was surprising to me to find that the most inefficient method of all those which they tested was the traditional Schafer prone-pressure method. The maximum exchange of air which is ordinarily achieved is about 185 cc. which was exceeded by all of the other methods tried. They found that the best method is the so-called Hogue and Nielson method by which approximately 580 cc. of tidal exchange can be obtained. The least complicated of the methods allows the patient to lie prone instead of supine; there is an advantage in the prone position because of drainage of mucus from the mouth, and a lesser likelihood of the tongue falling back to close the respiratory passage. The most satisfactory and probably the most simple method is a modification of the older Schafer prone-pressure method, and consists of alternating thoracic pressure and hip-lift. About 530 cc. of tidal air exchange was obtained by this method which introduces both an inspiratory and an expiratory phase. The Schafer method of applying pressure contributes to expiration and the hip life contributes the inspiratory air exchange. A method which was described in 1932 in England and came to be widely used there during the war, the teeter-totter or tilting board method, is not as efficient as most of us have been led to be-

lieve by the early descriptions of it. It contributes both inspiratory and expiratory phases because when the feet are tilted downward the abdominal contents pull down on the diaphragm and a negative pressure is created inside the chest. When the head is tilted downward the weight of the abdominal contents contributes an expiratory phase, but only about 225 cc. of tidal air per respiratory cycle were moved by this method.

An important consideration in selection of a method of trificial respiration is the estimated duration of the progess. If it is to be kept up for minutes or hours the physical effort that the operator puts into it is important and that is the reason for the prolonged popularity of the Schafer method; it is economical of effort on the part of the operator. The hip-lift method is somewhat less economical of effort and it is quite possible that many people who otherwise could act in an emergency to administer artificial respiration would not be able to use it, particularly if the victim of the accident were heavy. Doctor Bennett, I believe you have mentioned a further modification of this particular method.

DOCTOR BENNETT: The most recent modification involves a "hip-roll" instead of the hip-lift. You can imagine that if you had to lift a heavy individual's hips approximately fifteen times a minute, alternating with the application of pressure on the chest, you would soon become fatigued. Fortunately, instead of picking up the hips, you can accomplish almost the same effect by grasping the patient on one side and rolling that side upward. In other words, by rolling the patient temporarily to his side and down again, repeating the pressure on the chest in the intervals, you will accomplish the same end result and the method will be found much less fatiguing and therefore better suited for a sustained period of artificial respiration.

DOCTOR SMITH: Dr. Bennet, what place do stmulant drugs have in resuscitation in cardiovascular and respiratory emergencies as you see them in anesthesiology?

DOCTOR BENNETT: Most stimulants and autonomic drugs are probably overused and abused for purposes of resuscitation. I have already mentioned what I believe to be the first and most important steps in any resuscitation procedure; first, establish an air-way; second, be sure that respiratory exchange is adequate. Then investigate the circulatory system and see if it is functioning adequately; if it is not, and if it appears to be the type of circulatory depression that we call sympathetic or primary shock, an ordinary pressor drug, such as ephedrine or neosynephrin may be used to produce a near-normal blood pressure, and it should be given intravenously if the depression is severe. If the patient is suffering from circulatory collapse from loss of circulating blood volume then the component of the blood which has been lost should be replaced if it is possible. If blood has been lost and blood is available, give blood, after proper typing and cross-matching. If blood has been lost and only plasma is available, give plasma. This is the essential part of any resuscitation; any patient who is in a coma from cardiovascular collapse will benefit by these measures and will not be injured by the over-enthusiastic use of some stimulant drug. Now perhaps that has dismissed the use of stimulants in too brief a fashion to satisfy you. I think we can say that caffeine is useful in minor depressions because it is pretty hard to hurt anybody with caffeine in the usual doses — and it may do some good. Picrotoxin is not used very widely and is probably not commonly available in most offices and hospitals. It is a good drug in barbiturate poisoning but it requires scrupulous control in its use because its action is delayed. Even by intravenous administration, the full effect of picrotoxin does not appear for approximately 20 to 30 minutes after it has been given. Therefore, you may give it, then give more and more, and by the time the full effect does appear, the patient may be in harmful convulsions. This is obviously no way to treat a patient who needs resuscitation. Further depression may even be needed to control the convulsion and if a barbiturate is used, it in turn may outlast the stimulating effect of the picrotoxin. Metrazol is in about the same category as picrotoxin except that its action does appear more quickly. An additional advantage is that it is available in almost every office and hospital, Alpha-lobeline and coramine are of questionable benefit, although the latter drug at least, is quite widely used.

DOCTOR SMITH: From a pharmacologist's point of view, I would like to point out two or three things about these stimulant drugs. They have been mentioned but I believe they need additional emphasis. In the first place, there is no necessity to awaken completely the patient who has been depressed. If the patient is breathing well

and if his blood pressure is approximately normal and some time has passed since the stimulant drug has been given there is seldom need for giving more. The patient may still be sleepy or even comatose but he will survive if respiratory and circulatory function remain adequate. Secondly, the stimulant drugs should not be superimposed on an already over-stimulated respiratory center. Doctor Strenge pointed this out in connection with resuscitation in the newborn. It is also a good thing to remember in cases of depression with certain chemical agents. This is especially important in children because of the frequency of poisoning with the so-called essential oils such as citronella. These cause stimulation of the central nervous system, including the respiratory center, followed by a depression from overstimulation. A stimulant drug is not indicated in this condition but oxygen administration and artificial respiration certainly would be. Then of course we always have the possibility that a center is sufficiently depressed that it is not responsive to stimulant drugs. In such a case if we administer them and they fail to produce an immediate effect, artificial respiration may be resorted to, the patient resuscitated, and then we may encounter a late stimulation due to the effect of the drug on a center now made reactive.

Dr. Strenge has pointed out that mechanical respirators are seldom of benefit to the small child. In older children, however, mechanical respirators may be effective, and I have asked Doctor Strenge to say something about the indications for the use of such devices.

DORTOR STRENGE: The mechanical respirator is simply a mechanism for applying artificial respiration without the expenditure of muscular effort, therefore making it possible to continue such artificial respiration indefinitely. It is therefore indicated in any situation where the respiratory center is out of action for a long period of time. The first consideration in using such a device is again, to keep the air-way clear. The amplitude of respiratory activity which is imposed upon the patient has to be very carefully watched when using the mechanical respirator because its potentialities are relatively unlimited and one can easily injure the patient by too great negative pressure. With manual artificial respiration this is not nearly so easy to do. Therefore the magnitude of the negative pressure and the frequency to which the machine is adjusted must be carefully regulated to fit the patient in relation to his age and size. One can usually make a fairly accurate guess in the first place by knowing the normal rate and depth of respiration for a child of a given size and a further valuable check consists of observing whether the respiratory volume imposed on him is actually producing good oxygenation of the blood. One must keep constantly on watch for obstruction of the respiratory passages and frequent suction or even tracheotomy may be necessary if the obstruction becomes too difficult to manage. It should be pointed out that the respirator is not particularly adaptable to those cases where the difficulty is principally obstructive in nature. We might say a word at this time about the types of respirators available. Most commonly used—and the most useful, are the Drinker or Emerson tank types. There have been many attempts to make these instruments lighter, more portable and less expensive. The so-called chest type respirators are the most common among these newer adaptations. In our experience we have found them to be of limited use in treating acute respiratory paralysis because they cannot produce a sufficient respiratory exchange. They are very useful in the convalescent patient who needs assistance rather than complete replacement of his respiratory activity. The rocking bed is similarly useful although not in the acute, severely paralyzed case.

DOCTOR SMITH: One important consideration in connection with the use of respirators which was pointed out a number of years ago by Henderson, is the possibility of hyperventilation, if the respiratory volume is not correctly adjusted to the needs of the patient. If such hyperventilation continues for a considerable period of time it may lead to alkalosis and to hyperirritability, muscular twitching and a number of other undesirable, associated symptoms, I believe we should also mention at this time the newly developed method of electrophrenic stimulation in which an electrode is placed over the course of the phrenic nerve in the neck and respiratory exchange induced by direct stimulation of the nerve supply to the diaphragm. This method appears to be one of some promise in that it makes use of the normal muscles of respiration and does not lead to such undesirable complications as distention of the stomach, possible rupture of the alveoli etc., which can result from the injudicious use of too high positive pressure in certain methods of oxygen ad-

ministration. An excellent device for delivering oxygen is the "demand" system, which delivers only oxygen during inspiration. As is true of other methods, this one also has its disadvantages. First, there is the inconvenience and discomfort of a mask—which is a major problem when one attempts to use it with children. Second, the patient must be breathing spontaneously—although not necessarily at normal amplitude and frequency.

In connection with the newly developed methods of manual artificial respiration which we have discussed earlier in this session, it might be well to remember that many people have been trained in the Schafer method in connection with civil defense, Red Cross, Boy Scout and other activities. Therefore, if the newer Schafer-Emerson-Ivy method is to be used in places where some of these people trained in the earlier techniques might be watching, one should be prepared to defend the method against possible criticism.

In conclusion we should call attention to the fact that there are a great many situations involving the need for resuscitation measures which we have not had time to mention; for instance, the acute alcoholic, the patient who is severely depressed by over-dosage of barbiturates whether from accident or from suicidal motive. We have in addition made no attempt to deal with situations which require direct manopulation of the heart itself in severe cardiovascular emergencies.

BOOK REVIEWS

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY. W. A. Newman, A.M., M.D., F.A.C.S. 22nd. edition with 720 illustrations, including 48 plates. Philadelphia and London, 1951.

Like the reviewer, Dorland's has been on the medical firing line a full 50 years. But it has been more accurate than the reviewer and now is more up to date. The book can be brought up to the last word but not so the man who reviews it. But consecutively through 22 editions, this great medical lexicon has helped.

This semicentennial edition offers comprehensive coverage in new typography with the addition of new words and new illustrations. It is good to know that Dorland's, while including the new, has not discarded the old, and has not materially changed the handy format.

Among the new features are the "Fundamentals of Medical Etymology" and a table of "Modern Drugs and Dosage". The importance of the article on etymology for those who have not had a classical education is obvious when one realizes that 50 per cent of the general English vocabulary and 75 per cent of the scientific element are from Greek and Latin.

In its brief survey of this edition, the preface, with its acknowledgments, is impressive, indicative of untiring effort in pursuit of scientific words and their meaning. — Lewis J. Moorman, M.D.

NUTRITION AND ALCOHOLISM. Roger J. Williams. University of Oklahoma Press, Norman. 1951.

This book is of great interest because it pertains to the problem of alcoholism. Perhaps I am somewhat too skeptical but my personal reaction to the author's conclusions is that the tenor of his postulates are of the post hoc ad propter hoc variety.

Doctor Williams is of the opinion that nutrition in relationship to the organism is of primary important so far as alcohol is concerned. He has performed some experiements on rats and a few on human beings and arrived at the conclusion that if proper nutrition is sustained alcoholism will be prevented, possibly cured, or at least tolerated by individuals. He even believes that chronic alcoholics who have learned not to take the first drink can learn to drink again if they will follow his course of treatment.

He has introduced the germ "genetotrophic" which means that alcoholism is a condition that comes from both an inborn or hereditary trait and nutritional deficiency.

It has been my impression that alcoholism has many facets to its etiology, and although nutrition and heredity are no doubt of importance, there are aspects of the environmental background and stress that would render the genetotrophic theory a sort of "begging the question."

The book is well written and the author makes many generalizations that are quite stimulating and as Dr. A. J. Carlson says in the Foreword ". . . His (the author's) ideas and recommendations should by all means be given adequate tests.—Coyne H. Campbell, M..D

HANDBOOK OF MEDICAL MANAGEMENT. Milton Chatton, A.B., M.D., Sheldon Margen, A.B., M.D., Henry D. Brainerd, A.B., M.D., Second Edition. University Medical Publishers, Palo Alto, California. 1951.

This is a very concise and practical handbook which contains the new and accepted therapeutics advances of the past year. It contains 22 chapters and an appendix and index; and also a rapid index which is very unique (487 pages).

All the drugs mentioned in this book are the official or accepted drugs listed in one of the authoritative American references (U.S.P., N.F., or the N.N.R.) and in the authoritative British reference (B.P.). The code numbers from the Standard Nomenclature of Disease and Standard Nomenclature of Operations of the American Medical Association have been included with names of the diseases to facilitate the coding of records.

This book is presented in an outline form with numerous tables, charts, and scales which summarizes results and conclusions, thus omitting lengthy details.

This handbook should be on the desk of every general practitioner in active practice.—N. C. Riley, M.D.

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—reduces the excessive vagal stimulation characteristic of the ulcer diathesis by inhibiting stimuli at . . .

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By this action Banthīne consistently reduces hypermotility and, usually, hyperacidity.

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Suggested Dosage:
One or two tablets (50 to 100 mg.) every six hours.

SEARLE RESEARCH IN THE SERVICE OF MEDICINE

President's Page

During my few months in office, it has been my privilege and very real pleasure to present to members of this Association through the State a number of Honorary and Life Membership Certificates and Fifty Year Pins.

The By-Laws of the State Association require that the county societies must initiate all requests for granting these honors. Having seen the practical value of there presentations, from the standpoint of public relations and improved professional fellowship, I consider it my duty to urge upon each county society that it survey its membership very closely with the object of insuring that all eligible may be accorded the type of membership to which they are entitled and that Fifty Year Pins may be duly awarded to those who have so well earned that distinction by their years of faithful service.

The Executive Office has provided each county secretary with complete information concerning this matter and with simple forms which will facilitate the handling of these requests.

May I personally urge that each member of this Association bring to the attention of his county society the name of any physician he believes may be entitled to consideration for Honorary or Life Membership or the Fifty Year Pin.

L. McHenry

President

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Literature on Request

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APPOINTMENTS BEING MADE FOR ANNUAL MEETING COMMITTEES

Henry H. Turner, M.D., Oklahoma City, has been appointed general chairman for the 1952 Annual Meeting to be held in Oklahoma City at the Municipal Auditorium May 19-21. Doctor Turner will appoint other committees from the Oklahoma County Medical Society to assist in the successful promotion of the meeting.

The Technical Exhibits committee has already been appointed by Doctor Turner and consists of Vernon Cushing, M.D., Chairman, Charles Hugh Wilson, M.D., and Elmer Ridgway, M.D.

SCIENTIFIC WORK COMMITTEE

Charles M. O'Leary, M.D., chairman of the Scientific Works Committee, has announced the balance of his committee which includes M. M. Appleton, M.D., Oklahoma City; John Matt, M.D., Tulsa; Byron Aycock, M.D., Lawton, and John B. Morey, M.D., Ada.

Organizational meeting of the Scientific Work Committee was held in Oklahoma City August 16 and the committee has requested that any member of the Association who, desire to submit a paper for consideration at the Annual Meeting should immediately do so by sending the manuscript to C. M. O'Leary, M.D., Chairman, Scientific Works Committee, Medical Arts Building, Oklahoma City.

"BABY" PICNIC HELD

Honoring D. B. Ensor, M.D., practicing physician in Woods county for 36 years, a baby picnic was held in Alva September 9. For 90 days preceding the picnic, committees worked checking the records and writing the "babies" and their parents. Committees reported the response gratifying with more than 3,000 of Doctor Ensor's babies in attendance. Representing the O.S.M.A. were L. Chester McHenry, M.D., President, and Lewis J. Moorman, M.D., Secretary-Treasurer-Editor.

PRESIDENT McHENRY APPOINTS PUBLIC POLICY COMMITTEE

In line with the recommendations of the House of Delegates, the membership of the public policy committee has been increased from six to 12 with two members on the committee representing the six newly created congressional districts. Those who have been appointed to the committee and have accepted are as follows:

C. E. Lively, M.D., McAlester; John McDonald, M.D., Tulsa; E. A. McGrew, M.D., Beaver; Malcom Phelps, M.D., El Reno; Jack Records, M.D., Oklahoma City; Louis R. Ritzhaupt, M.D., Guthrie; Wayne Starkey, M.D., Altus; W. N. Weaver, M.D., Muskogee; and H. C. Weber, M.D., Bartlesville. Balance of the committee is tentative pending replies from those named to the committee who were on vacation. Doctor McDonald will continue as chairman of the committee.

HILLCREST APPROVED FOR INTERNS-RESIDENTS

Hillcrest Memorial Hospital in Tulsa and the University of Oklahoma School of Medicine have signed articles of affiliation for a post-graduate training program. Details of the intern-resident program have not been worked out but under the plan, the affiliated hospital can be recommended to graduate physicians, although the choi ecof internship lies entirely with the student. Hillcrest is the first Tulsa hospital to be accepted for affiliation with the university.

DO YOU KNOW?

That the Pottawatomie County Medical Society is sponsoring a series of radio plays about family life on station KGFF, Shawnee? Title of the series is "Hi, Neighbor!"

The county society pointed out that these radio plays show parents how the intelligent use of community resources can help solve simple personality problems. The course of programs, which began in July, will close September 29.

POSTGRADUATE STUDY FOR THE G. P. TO BE THEME OF A.M.A. SESSION

Postgraduate study primarily designed for the general practitioner will be the theme of the 1951 Clinical Session of the American Medical Association to be held in Los Angeles, December 4 through 7.

"Therapy will be stressed in a broad presentation of clinical studies on problems the general practitioner meets in daily practice," Dr. George F. Lull of Chicago, secretary and general manager of the A. M. A., stated. "Subjects of interest to the specialist will also be presented."

The four-day scientific program will include discussions and presentations on urology; general practice; general surgery; cardiovascular diseases; industrial medicine and surgery; eye, ear, nose and throat diseases; diseases of the chest, and neuropsychiatry.

Others will be on medical banks, radiology, anesthesia and pathology, traumatology as related to civil defense, obstetrics and gynecology, dermatology, internal medicine and pediatrics.

"In addition," Dr. Lull added, "practical clinical discussions, scientific exhibits and general lectures on basic problems are planned."

More than 2,000 hotel rooms have been reserved for attending physicians planning to attend the session. Doctors, however, are urged to make their hotel reservations in advance by writing to Chairman, American Medical Association Subcommittee on Hotels, 1151 South Broadway, Los Angeles 15, Calif.

PHYSICIANS' INCOME REPORT LISTS DATA BY STATES, SPECIALTIES

Department of Commerce report on physicians' incomes in 1949 recently made public reveal a number of facts and figures that are certain to be liberally invoked in connection with pending Congressional legislation.

J.A.M.A. points out that the report indicates there is no national shortage of physicians, at least there wasn't in 1949, because net incomes would have been much higher if a shortage existed.

Minnesota practitioners had the highest average income ($13,175); neurological surgery was the most lucrative specialty in private practice ($28,628) according to the report, and New England was listed as the lowest income region ($9,442) while the West Coast was the highest ($12,827).

For the whole country, physicians' average net income before taxes was $11,058. Those in independent practice averaged $11,858, compared to $8,272 for the salaried. Gross incomes ranged from $100 for year 1949 to $550,000 (net income range among the 55,000 respondents in the questionnaire survey was from minus $5,000 to a net profit of $200,000). Average physician practicing in a partnership had an annual net income of $17,722, compared with $10,895 for the independent private practitioner.

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The Thoracic Surgeon . . .

will find aureomycin of benefit in the complications of pneumonias refractory to other forms of therapy, particularly in those very serious forms caused by the staphylococcus or by *Klebsiella pneumoniae*. In the pneumonic involvements of psittacosis, tularemia, rickettsial disease or mucoviscidosis, aureomycin is highly effective. It is also very useful in the ambulatory or surgical management of bronchiectasis. Multiple lung abscesses have been known to heal with aureomycin treatment alone. In operative thoracic procedures, aureomycin is invaluable.

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ANNOUNCEMENTS

OKLAHOMA CITY CLINICAL SOCIETY. October 29, 30, 31, November 1, 1951, Biltmore Hotel, Oklahoma City.

SOUTHERN MEDICAL ASSOCIATION. November 5-8, 1951, Dallas, Texas.

AMERICAN COLLEGE OF CHEST PHYSICIANS. Interim Session, Ambassador Hotel, Los Angeles, Calif., December 2 and 3, 1951.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY. Announces change of address. All communications should be addressed to: Robert L. Faulkner, M.D., Secretary-Treasurer, American Board of Ob. and Gyn., 2105 Adelbert Road, Cleveland 6, Ohio.

SURGICAL PATHOLOGY. Postgraduate course will be conducted at the University of Oklahoma School of Medicine beginning November 1, 1951, and will meet each Thursday evening for 10 consecutive weeks, except Thanksgiving. Dr. James Dewar, Associate Professor of Pathology, will teach the course and enrollment is designed as a review of surgical pathology for those physicians preparing for surgical specialty board examinations.

GENERAL SURGERY. Postgraduate course will be held at Hillcrest Hospital, Tulsa, October 4 and 5. Of interest to the general surgeon, the course is sponsored jointly by the Tulsa members of the American College of Surgeons and the Office of Postgraduate Instruction, University of Oklahoma School of Medicine. Attendance at operative clinic will be limited, so early registration is advised. Registration fee is $15.00. Speakers will be Conrad G. Collins, M.D., New Orleans; Eugene M. Bricker, M.D., St. Louis; David State, M.D., Minneapolis; and Harold L. Thompson, M.D., Los Angeles.

ANNUAL CLINICAL SOCIETY CONFERENCE IS THIS MONTH

Guest speaker at the Oklahoma City Clinical Society banquet October 29 will be John W. Cline, M.D., President of the American Medical Association. Dates for the 21st annual session of the conference are October 29-November 1, and all scientific sessions will be held at the Biltmore Hotel, Oklahoma City.

Sixteen guest lecturers as well as several Oklahoma City physicians and teachers will appear on the program. In addition to the general assemblies and panel discussions, there will be daily luncheon round table questions and answers session and a clinical pathologic conference. Entertainment will include dinner meetings, annual Clinic Dinner Dance, and the stag smoker.

GRIEVANCE COMMITTEE-MEDICAL BOARD MEET

Grievance Committee of the Oklahoma State Medical Association and members of the Medical Board had a joint ssesion Sunday, September 2.

The meeting of the Committee and the Board was for the purpose of discussing the manner in which there might be complete cooperation. The matter of gathering testimony with regard to industrial cases and license revocations was of principle interest at the meeting. It is contemplated that additional meetings between the Committee and the Board will be held from time to time.

Pictured above are physicians receiving their Life Membership certificates at Pauls Valley. Left to right: John R. Callaway, M.D., Pauls Valley; A. R. Sugg, M.D. (OSMA president-elect who made the presentations), Ada; M. E. Robberson, M.D., Wynnewood; and A. H. Shi, M.D., Stratford.

FROM OUR EARLY FILES

25 YEARS AGO

DR. FRANK R. VIEREGG, Oklahoma City, has moved to Clinton.

DR. E. B. THOMASSON, Duncan, is taking several weeks postgraduate surgery work at Chicago and Rochester, Minn.

DR. W. P. SPENCE, Sayre, has returned from a three weeks' course at the Mayo Clinic, and attended at a family reunion at Peoria, Ill.

DR. LE ROY LONG, Oklahoma City, Dean of the University Medical Department, has returned after spending July, August and September in European Clinics.

DR. ELIAS MARGO, of the McBride Reconstruction Hospital, Oklahoma City, is in New York at the Hospital for Ruptured and Crippled, taking postgraduate work.

WESLEY HOSPITAL, Oklahoma City, is reported to have planned an addition to cost about $150,000, to be built within the next few months, increasing the size of the accommodations by 50 beds.

DR. RURIC N. SMITH, Tulsa, is in Philadelphia, attending Dr. Chevalier Jackson's Clinic.

DR. E. S. LAIN, Oklahoma City, attended the Lake Mohonk (N. Y.) Conference where a symposium on the "Control of Cancer" was held September 20-24.

NEW HOSPITAL OPENS AT LAWTON

Charles Green, M.D., Lawton, has been elected president of the new million dollar Comanche County Memorial Hospital at Lawton.

Other officers elected were Leslie T. Hamm, M.D., Lawton, vice-president; and Robert P. Dennis, M.D., Lawton, secretary. In addition to the three elected officers, those who will serve on the executive committee are Donald Angus, M.D., and Charles S. Graybill, M.D., both of Lawton. There are 20 active memberships in the new hospital and seven courtesy memberships. Active staffers must handle charity patients and answer emergency cases. Doctors who hold courtesy memberships on the staff are not eligible to vote or hold office on the hospital staff organization.

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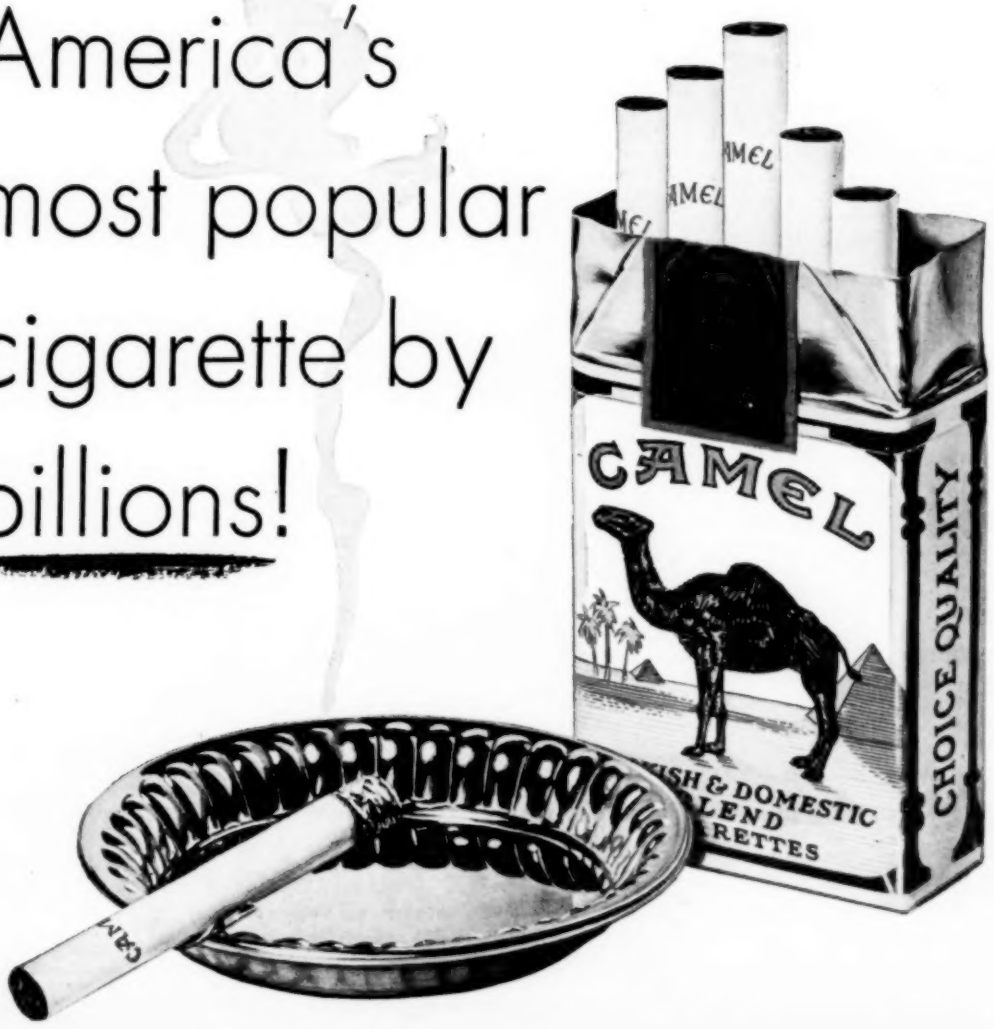

HAVE YOU HEARD?

Lawrence W. Patzkoowsky, M.D., has opened his office in Alva. He has just completed his internship at Mercy Hospital, Oklahoma City.

A. W. Truman, M.D., Ardmore, was speaker recently at the Seventh Day Adventist encampment.

William H. Garnier, M.D., Stillwater, is taking an eight month postgraduate course in ophthalmology at Washington university, St. Louis.

Robert J. Terrill, M.D., formerly of Texas, is now practicing in Enid.

E. H. Mayes, M.D., has assumed direction of the health program in Caddo, Stephens and Jefferson counties.

James L. Green, Jr., M.D., will direct the heatlh program in Pontotoc, Murray and Hughes counties.

J. C. Canada, M.D., is the new director of the health programs in Cherokee, Araid, Delaware and Moore counties.

John F. Burton, M.D., Oklahoma City, was recently pictured in the Daily Oklahoman with his banana tree that boasted two stalks of bananas at that time.

C. L. Rogers, M.D., Watonga, recently returned from a trip to Cuba.

Jim and Phil Haddock, M.D., Norman, have opened a new clinic in that city.

Mack I. Shanholtz, M.D., former director of Seminole County Health Department, assumed his new duties October 1 as Director of the Virginia Department of Health.

BLOODMOBILE OPERATION WILL BEGIN IN OCTOBER

Owing to the delay in remodeling the Oklahoma Defense Blood Center building at 323 N. W. 10th, Oklahoma City, and the urgent need for blood for the armed forces, the Red Cross has announced that it will begin operating its bloodmobiles in October according to J. R. B. Branch, M.D., Medical Director.

The Oklahoma Medical Research Foundation has offered space from which these operations can be made. Rooms are provided for central service where supplies are made up and sterilized; laboratory accomodations are available as are rooms for packing and shipping of blood.

Seven of the 14 necessary nurses have already been engaged at press time. A senior and junior technician have also been employed and James Park Dewar, M.D., director of surgical pathology and associate professor of pathology at the University Hospital and School of Medicine, has been appointed as consultant pathologist.

The plan of operation will be to put one bloodmobile in the counties and keep on active in the Oklahoma County and City area. By June 30 a minimum of 40,000 pints of blood must be collected.

CLASSIFIED ADS

FOR SALE: G. E. 5-30 combination radiographic and fluoroscopic unit, instrument cabinet, examining table and various other pieces of equipment and surgical instruments good as new. Write Key D, care of the Journal.

FOR SALE: By widow of recently deceased physician, office furniture and instruments including x-ray, typewriter, refrigerator, baby bed, scales and many other items of office and laboratory equipment. Write Key B, care of the Journal.

NOTICE: Would like to contact phsician interested in industrial medicine, full time, permanent. Must be under 40 years of age, physicaliy fit. Write Key C, care of the Journal.

FOR SALE: Practice of well established recently deceased physician. Office located on third floor of Manhattan Bldg., Muskogee, consists of five rooms, complete E.E.N.T. equipment including new refracting units and audiometers, autoclaves, etc. Same location for 15 years. Write Key M, care of the Journal.

FOR SALE: One 100 MA Westinghouse Pandex x-ray with flouroscopic and bucky attachments; counter balance table. Also numerous other appliances, such as developing tank, etc., that go with x-ray. Used less than one year. Can be seen at the Merkel X-Ray Company, Tulsa, Oklahoma, and will be installed by them. Guaranteed to be in good condition. Write Key E., care of the Journal.

FOR SALE: Almost new Raytheon diathermy. Write Key P, care of the Journal.

FOR SALE: 14 bed hospital and clinic, southeastern part of state. County Seat town. Trade area 19 thousand. Write Key F, care of the Journal.

FOR SALE: 50 M.A. 96 KV heavy duty Aloe x-ray. Fluoroscope machine with table and synchronize traveling bucky. Complete with cassette, hangers and all darkroom equipment. In use three months. Warren Gibson, Phone 1003, Lindsey Memorial Hospital, Pauls Valley, Oklahoma.

WANTED. An assistant surgeon in industrial clinic. Qualifications and personality must be exceptionally satisfactory. Excellent opportunity for right party. Write Key J, care of the Journal.

WANTED: Registered laboratory technician by two physicians in Sapulpa. Monthly salary $250 plus half the fee of lab work done for the other doctors. Urgent that position be filled immediately. Write Key J, care of the Journal.

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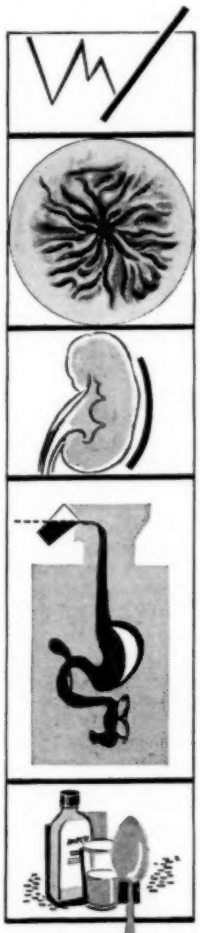

relieves pain promptly	stops gastric corrosion
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no kidney damage	imposes no added burden on kidney function
never causes alkalosis	buffers gastric contents moderately; permits normal neutralization of alkaline secretions of upper intestine
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Relationship of Stress to Autonomic Lability

Studies in psychosomatics have shown that functional disorders often are a result of the patient's inability to adjust to emotionally stressful situations (stressor factors).

Nervous tension and chronic anxiety, discharged through a labile Autonomic Nervous System, can cause somatic disturbance. [1,2] Such states may involve any one of the organ systems or several at one time. [1,3] The outline below is designed to relate gastrointestinal and cardiovascular symptomatology to the exaggerated response of the autonomic nervous system.

	Physiologic Effects of Autonomic Discharge	
	Sympathetic	Parasympathetic
Gastro-intestinal System	Hypomotility Intestinal Atony Hyposecretion Reduced salivation	Hypermotility Gastrointestinal spasm Hypersecretion
Cardio-vascular System	Rapid heart rate Peripheral vaso-constriction	Slow heart rate Vasodilatation
Functional Manifestations	Palpitation Tachycardia Elevated blood pressure Dry mouth and throat	Heartburn Nausea-vomiting Low blood pressure Colonic spasm

The data here tabulated is from references 3,4,5,6,7, given below.

When the clinical picture is suggestive of functional disorder, the diagnosis is supported by the presence of the following indications of autonomic lability:

Variable Blood Pressure
Body Temperature Variations
Changing pulse rate
Deviations in B. M. R.
Exaggerated Cold Pressure Reflex
Oculo-Cardiac Reflex Abnormalities
Glucose Tolerance Alterations

Therapy in these cases is directed toward: 1) relieving the somatic disturbance to prepare the patient for psychotherapy*; 2) guidance in making adjustment to stressful situations and correction of unhealthy attitudes.

*Drug treatment using adrenergic and cholinergic blocking agents in conjunction with sedatives. [8,9,10.]

1. Ebaugh, F.: Postgrad. Med. *4:* 208, 1948. 2. Wilbur, D.: J.A.M.A. *141:* 1199, 1949. 3. Williams, E. and Carmichael, C.: J. Nat'l. Med. Assoc. *42:* 32, 1950. 4. Goodman, L. and Gilman, A.: The Pharmacological Basis of Therapeutics, The Macmillan Co., 1941. 5. Katz, L. et al: Ann. Int. Med. *27:* 261, 1947. 6. Weiss, E. et al: Am. J. Psychiat. *107:* 264, 1950. 7. Alvarez, W.: Chicago Med. Soc. Bulletin, 581, 1950. 8. Rakoff, A.: A Course in Practical Therapeutics, Williams and Wilkins, 1948. 9. Karnosh, L. and Zucker, E.: A Handbook of Psychiatry. C. V. Mosby Co., 1945. 10. Harris, L.: Canad. M.A.J. *58:* 251, 1948.

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CURRENT ACTIVITIES AT THE OKLAHOMA MEDICAL REESARCH FOUNDATION

EDWARD C. REIFENSTEIN, JR. M.D., Director

For several years citizens of Oklahoma have known that a unique center for Medical Research was developing in their State under the auspices of the Oklahoma Medical Research Foundation. Since the intial impetus for this enterprise arose from physicians it seems appropriate to report the current activities of the Oklahoma Medical Research Foundation to the medical profession at regular intervals. It is our purpose, in this column, to acquaint you with the physical plant, the operational plans, the scientific personnel, and the research activities of the Oklahoma Medical Research Institute and Hospital.

About five years ago Doctor Tom Lowry, Dean of the University of Oklahoma School of Medicine and a member of the Council of the Oklahoma State Medical Association, advanced the idea of a medical research foundation. The Council gave approval and pledged support with the reservation that it could not officially participate in the campaign for funds. The plan was sponsored by the Journal of the Oklahoma State Medical Association carrying an initial editorial prepared by Doctor Lowry. This was supplemented by successive editorial comments. Following Doctor Lowry's editorial, he and other members of the Council contacted representatives of the O. U. Alumni for a discussion of the proposed foundation. This resulted in a rejuvenation of the Alumni Association. The principle alumni bringing about the reactivation were Lee Emenhiser, W. Floyd Keller, John Lamb, Onis Hazel, Fred Woodson, Evans Talley, Bill Finch and others supplying the initiative and enthusiasm necessary for the organization, the membership and promotion of the plan.

The Alumni Association raised approximately $25,000.00 which was used to retain the firm of Marks and Lundy of New York to survey the state as to the amount of money that could be raised. This survey was made by representatives of Marks and Lundy through the assistance of not only interested alumni but many other members of the State Medical Association who arranged for county medical society meetings and contributed freely in time and effort.

Following the survey by Marks and Lundy the permanent organization, including lay personnel, was completed, although prior to this time lay individuals had been interested in the project, including Mr. Ancel Earp who became the first president of the organization.

Some time after the report Marks and Lundy was filed and the fund raising campaign was underway with the assistance of personnel from not only the Medical Association and the Alumni Association and the Allied Professions and many others, came the employment of full-time local personnel.

During the time of the campaign within the profession, teams were organized to visit practically every county medical society in the state and to contact individual physicians who might be able to make substantial contributions, as well as officers of the county societies. Physicians from other schools manifested equally as much enthusiasm as the O. U. Alumni and the committees were made up regardless of the individual's alma mater. Thus the adventure exhibited a fine coordination and amalgamation of professional and non-professional groups with one common goal in view.

Thus the Oklahoma Medical Research Foundation was established as an independent, privately owned, non-profit organization. It is governed democratically by a Board

of Directors of outstanding industrial, civic and professional persons.

The Foundation was fortunate in its intial move. It secured the services of Hugh G. Payne, a man previously well known to the physicians throughout the state, who serves also as Executive Secretary of the Alumni Association. Mr. Payne consented to serve as General Manager of the Foundation and under his guidance the enterprise has had a vigorous growth. Mr. Payne also supervises the finances of the Research Institute and Hospital.

Mr. Ancel Earp, a business man from Oklahoma City, was the first President of the Board of Directors. Under his leadership and with the help of Mr. Payne, a campaign was conducted throughout the State. The response of the citizens of Oklahoma was most gratifying; not only physicians but many other persons affiliated with the healing professions, including dentists, pharmacists, and nurses, became members of the Foundation as well as a large group of lay persons interested in the welfare of their fellow men. Today the Foundation has received contributions from over 7,000 citizens. This broad financial support of a Research Institution is unique.

Mr. Earp served as President from August 1946 to October 1947, and Mr. J. C. Puterbaugh, of McAlester, from October 1947 until October 1950. At the present time Mr. Ted R. Warkentin, of Lawton, is President of the Board.

The founding group, encouraged by the financial support accorded them during their first months of operation, established a Building Committee. The members of this group, at their own expense, traveled extensively throughout the United States to gather, from other Research Institutions, ideas to assist them in developing a building with ultra modern laboratory facilities. The building was designed by Coston and Frankfurt, Architects of Oklahoma City, and was built by the J. J. Bollinger Construction Company, of Oklahoma City. The cornerstone was laid on July 3, 1949, with appropriate ceremonies by Sir Alexander Fleming, the discoverer of Penicillin. The total cost of the building, with basic laboratory equipment installed on the second floor only, was $84,000.00. The formal opening took place on December 17, 1950.

The Research Institute Building is located at 825 Northeast 13th Street, adjacent to the University of Oklahoma School of Medicine Building, and across the street from the University Hospital. The Institute Building is three stories high, with a basement, and with a "monitor" floor on top, which houses most of the air-conditioning and servicing machinery. The building has an overall length of 232 feet, and has in addition an animal wing 125 feet in length which extends at right angles to the laboratory building. In the Research Institute proper there are 44,000 square feet of floor space. The building, of modern functional design, is constructed of concrete, glass, and brick. It is completely air-conditioned, and there is a separate unit for the animal wing. The first floor is devoted to offices for the administrative staff of the Oklahoma Medical Research Foundation, and to facilities for servicing and maintaining the building, the research laboratories, and the investigative program. The second and third floors are devoted to research activities. There are 46 laboratory units 10 feet wide and varying in length from 16 to 20 feet. A portion of these have been equipped with basic installations of stainless steel desks, sinks and hoods. The remaining units have been developed into a central research laboratory which will be described in more detail in a later communication. One of the special features of the Institute is a three unit Isotope Laboratory, where studies on radioactive materials obtained from the Atomic Energy

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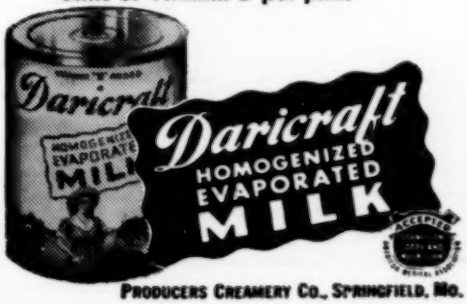

PRODUCERS CREAMERY CO., SPRINGFIELD, MO.

A MOST CORDIAL WELCOME awaits physicians of the South attending the Dallas meeting which will consist of forty-seven half-day sessions presented by the twenty-one sections embracing every phase of medical practice. In addition to these activities there will be two general sessions, the annual dinner of the association, and outstanding scientific and technical exhibits.

THE COMPLETENESS of the program and the excellence of the exhibits will again make this meeting of the Southern Medical Association the outstanding general medical meeting of the year for physicians of the South.

REGARDLESS of what any physician may be interested in, regardless of how general or how limited his interest, there will be at Dallas a program to challenge that interest and make it worthwhile for him to attend.

MEMBERS of state and county medical societies may attend. Eligible physicians, members of state and county medical societies in the South can be and should be members of the Southern Medical Association. The annual dues of $10.00 include the Southern Medical Journal, a journal most valuable to physicians of the South, one that each should have on his reading table.

SOUTHERN MEDICAL ASSOCIATION
Empire Building
BIRMINGHAM 3, ALABAMA

Commission are conducted; this laboratory is a joint project of the University of Oklahoma School of Medicine. On each of the two laboratory floors there is an unusual suite of rooms with a double walk-in refrigerator. The outer refrigeration room contains a laboratory bench and can be maintained at exact temperatures down to zero degrees Fahrenheit. The laboratory units are constructed with partitions that can be easily moved, and, since all of the utilities are located along the outside walls, it is possible to develop laboratories of varying size in multiples of 10 feet as needed with a minimum of effort and expense.

In the animal wing very modern facilities are available for the humane care of animals. These include a special diet kitchen; a hugh walk-in copper sterilizer for cages; modern surgical rooms with overhead lights, autoclaves and scrub sinks, entirely similar to those in the usual hospital; rooms for the housing of the various types of animals required by the research projects, and rooms for special procedures.

In addition, there is a library-reading room and a lounge for the Scientific Staff, and several conference rooms. The Research Institute Building is connected with the Medical School by a covered passageway, and with the University Hospital by a tunnel which passes under the intervening 13th Street. This makes it possible for patients, supplies, and medical speciments to be conveniently and safely transported between the University Hospital, the Research Institute and Hospital, and the School of Medicine. The Institute Building is located on land donated by the University of Oklahoma, and given outright to the Foundation by an Act of the Oklahoma State Legislature.

When the Research Institute Building was partially completed the Fundation received a generous construction grant from the National Institute of Health in Washington. The funds, which totaled $225,000.00, were given as equal contributions from the National Cancer Institute and the National Heart Institute. With this money and with additional funds supplied by the Foundation, a Research Hospital wing has been constructed at right angles to the Research Institute Building at the opposite end from the Animal Wing. The Research Hospital, a one story building with walls of sufficient strength so that two additional floors can be added when expansion becomes necessary, has 14 patient rooms which are designed to care for 22 beds. In addition, there is a diet-kitchen and diet-serving-pantry, a dining room for the patients, offices and utility rooms for the nurses, the dietitians, and the medical resident staff, a room for x-ray equipment, and a recreation room for the patients. The construction work on the Research Hospital was completed in June 1951. The hospital is not yet in opertaion.

Many visitors have inspected the facilities of the Oklahoma Medical Research Institute and Hospital. They are unanimous in their opinion that the physical plant is one of the finest that exists today for the prosecution of medical research.

DOCTOR DRAFT POSTPONED AGAIN

The defense department temporarily delayed once more the plan to draft priority one physicians in August and September. It was originally planned to draft 333 physicians in this category in August and 152 in September.

Priority one physicians are those who received their medical education at government expense or were deferred from service during World War II to attend medical school and who have served less than 90 days in the armed forces.

Fightin' Talk

Recent promotions include *James F. Hohl* who has been promoted from captain to major. He is commanding officer of the medical company of the 21st infantry regiment, 24th division, Korea. Graduating from the University of Oklahoma School of Medicine in 1944, he practiced in Stroud and with the student health service at the University of Oklahoma, Norman. In July, 1950, he received a fellowship in internal medicine at the Lahey Clinic, Boston, and later was granted a leave of absence to enter military service. Major Hohl is the son of Mr. and Mrs. L. B. Hohl, Sand Springs. His wife, the former Betty Chowning, and daughters Katherine and mary, are residing with her parents, Mr. and Mrs. S. L. Chowning, 1546 South Yorktown, Tulsa.

Complete addresses have been received for two more physicians serving with the 45th Division. They are:

Lt. Col. Roger Reid, 120th Medical Battalion, APO 86, c/o Postmaster, San Francisco, Calif. He is from Ardmore.

Captain Henry G. Ryan, 179th Medical Battalion, APO 86, c/o Postmaster, San Francisco, Calif. Capt. Ryan is formerly from Healdton.

Nolen L. Armstrong, a first liteutenant in the Air Force, is now stationed in Munich, Germany, as flight surgeon for a fighter group. Lt. Armstrong's address is MC, USAF, 36th Medical Group, APO 208, c/o Postmaster, New York N. Y. Lt. Armstrong writes, "I'm enjoying it very much as well as getting some quite good medical experience."

Capt. R. D. Anspaugh, Oklahoma City, was previously reported at Ft. Riley, Kansas, but is now at Fort Sill.

Capt. Walter Cale, Sapulpa, is stationed at the Medical Field Service School, Fort Sam Houston, Texas.

Capt. Jenner J. Coyle, Oklahoma City, is also stationed at the Medical Field Service School.

Capt. Benjamin F. Gorrell, Tulsa, is now stationed at Sandia Base, New Mexico.

Four other physicians who left recently for the Medical Field Service School are: *Capt. John Marion Brown*, Oklahoma City; *First Lt. R. K. Endres*, Sallisaw; Firts *Lt. Melvin C. Hicks* and *Orlando Jack Miller*, Oklahoma City.

ARMY REGULATIONS OUTLINING MEDICAL CARE BY CIVILIAN PHYSICIANS

One of the most important and necessary services furnished the American soldier is adequate and timely medical care and treatment, including hospitalization. This service is provided for Army personnel in the United States generally by dispensaries, and hospitals located at the many Army installations throughout the country. There are many locations, however, where Army or other United States federal medical treatment facilities are not available when medical service is required by Army personnel. In cases of this nature, the services of civilian physicians, clinics, and hospitals are necessary. With the expansion of the Army and the deployment of Army personnel to practically all points in the United States either on a duty, travel, or leave status, the continued cooperation of civilian physicians and agencies is of utmost importance in providing adequate medical service to the U. S. soldier in time of need.

Certain criteria and procedure have been established in connection with the furnishing of medical service to Army personnel by civilians in accord with the current laws and regulations: These criteria define the conditions under which individuals of the Army may be authorized civilian medical care at the expense of the Army. These procedures include methods for reporting and receiving payments for treatment or hospitalization of Army personnel by the civilian medical agencies.

Civilian medical care (other than elective) at the expense of the Army is authorized for commissioned officers, contract surgeons when employed by the Army on a full-time basis, warrant officers, enlisted personnel, cadets of the United States Military Academy, general prisoners and prisoners of war when these personnel are on a duty status or when they are absent from their place of duty on leave or informal leave (pass) status. Applicants for enlistment in the Army and selectees also are authorized necessary civilian medical care at the expense of Army funds while they are being processed for enlistment or induction into the Army. Payment for civilian medical expenses incurred by Army personnel who are absent without leave is not authorized. Any obligations resulting from civilian medical care to Army personnel who are absent without leave are the responsibility of the Army individual concerned.

Normally, civilian medical care for Army personnel is authorized only when there are no other federal medical treatment facilities available. First aid or emergency treatment is authorized at any time, notwithstanding the proximity of Army or other federal medical treatment facilities. In this connection, emergency medical care may be defined as that required to save, life, limb, or prevent great suffering. Surgical operations should not be performed without prior approval of military authorities, unless indicated as an emergency procedure. Elective medical treatment in civilian medical treatment facilities or by civilian physicians will not be authorized as Army funds cannot be used for payment for these services.

Due to the limitation of funds available to the Army, medical care of dependents of military personnel may obtain available medical care at Department of Defense medical facilities only. Any obligations resulting from civilian medical care to dependents of military personnel are the responsibility of the dependents concerned or their sponsors.

As a general rule, local military commanders will furnish the civilian medical agency with prior written authority for ordinary medical care to Army personnel under his jurisdiction. In such cases, prior arrangements with the civilian medical agency will be made by the individual or by a proper military authority. For emergency cases treated without prior written authorization, the surgeon of the nearest military command should immediately be notified by the civilian medical agency, giving the individual's name, organization, nature of illness or injury and statement of the practicability of transfer of the patient to an Army or other governmental hospital. The civilian agency or physician then will be advised without delay by the appropriate military authorities as to procedures to be followed.

Bills for authorized medical care and treatment of Army personnel should be submitted to the commanding officer of the organization to which the patient belongs, or to the military authority who provided the authorization for the medical service. If the location of these individuals is not readily known or if such military commanders authorizing treatment have moved to another station, the bill should be sent to the military authority listed below.

For services rendered in the following states: FOURTH ARMY AREA: Arkansas, Louisiana, New Mexico, Oklahoma, Texas, submit bills to The Surgeon, Fourth Army, Fort Sam Houston, Texas.

OKLAHOMA STATE MEDICAL ASSOCIATION

Executive Office—1227 Classen, Oklahoma City, Oklahoma. Phone 79-1648.

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Commerce Exchange Building
Oklahoma City, Oklahoma

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District No. 9: Adair, Cherokee, McIntosh, Muskogee, Okmulgee, Sequoyah, Wagoner.—Shade Neely, M.D., Muskogee (C) 1952; F. R. First, Jr., M.D., Checotah, (V-C) 1952.

District No. 10: Haskell, Hughes, Latimer, LeFlore, Pittsburg.—E. H. Shuller, M.D., McAlester (C) 1953; Paul Kernek, M.D., Holdenville (V-C) 1953.

District No. 11: Atoka, Bryan, Choctaw, Coal, McCurtain, Pushmataha — A. T. Baker, M.D., Durant (C) 1954; T. E. Rhea, M.D., Idabel (V-C) 1954.

District No. 12: Carter, Garvin, Johnston, Love, Marshall, McClain, Murray, Pontotoc.—J. H. Veazey, M.D., Ardmore (C) 1952; W. T. Gill, M.D., Ada (V-C) 1952.

District No. 13: Caddo, Comanche, Cotton, Grady, Jefferson, Stephens.—H. M. McClure, M.D., Chickasha (C) 1953; J. B. Miles, Anadarko (V-C) 1953.

District No. 14: Greer, Harmon, Jackson, Kiowa, Tillman, Washita — L. G. Livingston, M.D., Cordell (C) 1954; J. B. Hollis, M.D., Mangum (V-C) 1954.

ANNOUNCING THE TWENTY-FIRST ANNUAL CONFERENCE OF THE

OKLAHOMA CITY CLINICAL SOCIETY

October 29, 30, 31 and November 1, 1951

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